



# 2022-2025 Released Tests

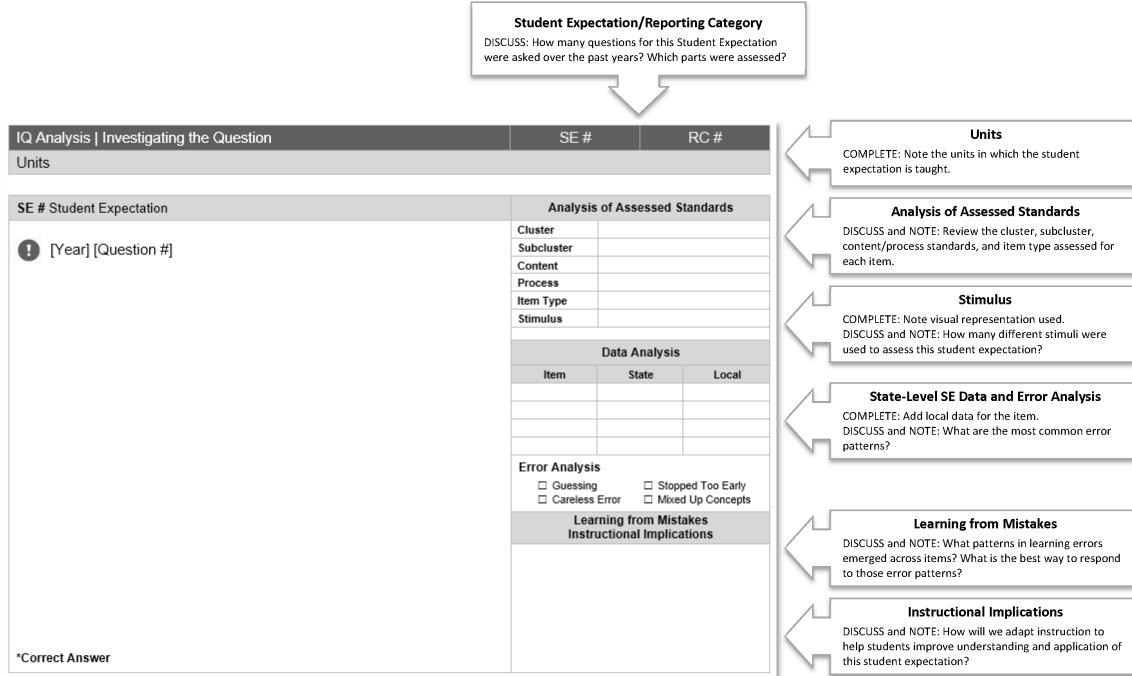
## Aligned to the Standards

CONTENT BUILDER FOR THE PLC

# Math

# Algebra I

## IQ Analysis | Investigating the Question – Released Tests User Guide



In conjunction with the IQ analysis tool, the lead4ward field guides can be a helpful resource for understanding error patterns and instructional implications.

[Learn more](#)

# Linear Functions

**A.2 Linear functions, equations, and inequalities.** The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations.

**A.3 Linear functions, equations, and inequalities.** The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations.

**Connected Knowledge and Skills A.4, A.5, A.12**

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

! 2025 – Q16

An amusement park charges \$44.95 per person for admission and \$20.00 per car for parking. For purchases of at least 1 ticket, the table shows the relationship between  $p$ , the number of people in a car, and  $c$ , the total cost in dollars.

**Amusement Park Costs**

Number of People, $p$	Total Cost, $c$ (dollars)
1	64.95
2	109.90
3	154.85
4	199.80

The amusement park states that at most 4 tickets can be purchased. What is the range of the function in this situation?

- (A)  $1 \leq p \leq 4$
- (B)  $64.95 \leq c \leq 199.80$
- (C)  $\{1, 2, 3, 4\}$
- (D)  $\{64.95, 109.90, 154.85, 199.80\}$

\*Correct Answer (D)

#### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions	
<b>Subcluster</b>	Describing Linear Functions	
<b>Content</b>	Readiness	
<b>Process</b>		
<b>Item Type</b>	Multiple Choice (1 pt)	
<b>Stimulus</b>		

Data Analysis		
Item	State	Local
A		
B		
C		
D*	48	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
A		
B*	58	
C		
D		

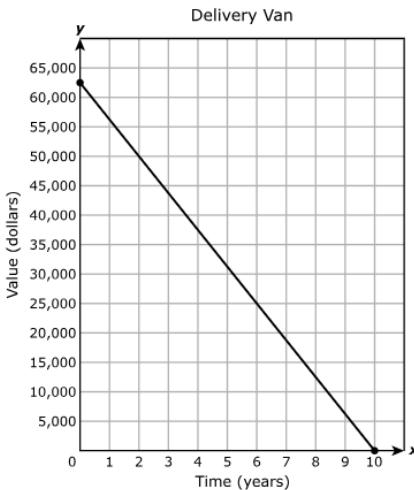
### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

2025 – Q37

The owner of a business purchased a delivery van for \$62,500. For accounting purposes the owner identified a constant depreciation on the value of the van. The graph shows the linear relationship between  $y$ , the value in dollars of the delivery van, and  $x$ , the time in years.



Which inequality best represents the domain of the function for this situation?

- (A)  $0 \leq y \leq 10$   
 (B)  $0 \leq x \leq 10$   
 (C)  $0 \leq y \leq 62,500$   
 (D)  $0 \leq x \leq 62,500$

\*Correct Answer (B)

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
A		
B*	46	
C		
D		

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**(A)** Domain: {110, 220}

Range: {1, 2}

**(B)** Domain: {1, 2}

Range: {110, 220}

**(C)** Domain: all real numbers

Range: all real numbers

**(D)** Domain: all integers greater than or equal to zero

Range: all integers greater than or equal to zero

\*Correct Answer (B)

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
A		
B*	67	
C		
D		

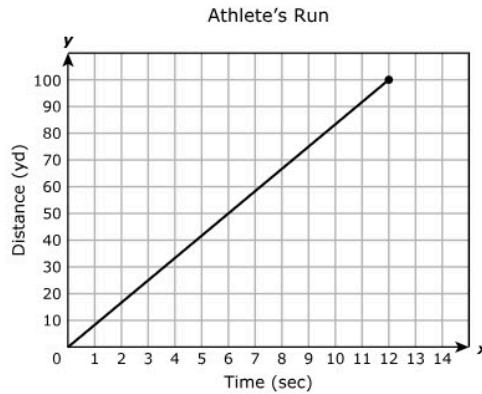
### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

2024 – Q49

An athlete ran at a constant speed for 12 seconds. The part of the linear function shown represents the distance the athlete ran in yards,  $y$ , as a function of the time in seconds,  $x$ .



What is the domain of the function for this situation?

- A  $0 \leq x \leq 14$
- B  $0 \leq x \leq 12$
- C  $0 \leq y \leq 110$
- D  $0 \leq y \leq 100$

\*Correct Answer (B)

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Inline Choice (2 pts)
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
Full Credit	33	
No Credit	44	
Partial Credit	22	

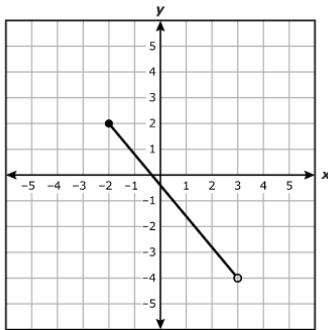
### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

2023 – Q7

A part of a linear function is shown on the grid.



What is the range of the part of the linear function shown?

Choose the correct answer from each drop-down menu to complete the sentence.

The range is the set of all real numbers  and .

\*Correct Answer (Greater than -4, less than or equal to 2)

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

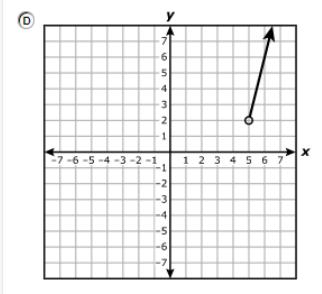
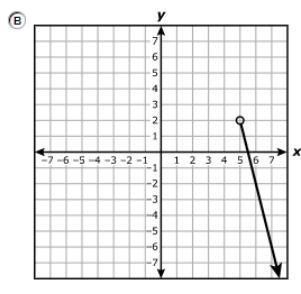
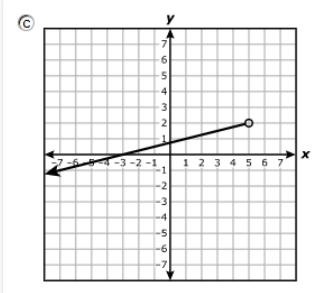
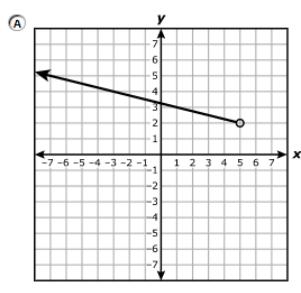
<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

### ! 2023 – Q46

The domain and range of part of linear function  $r$  are given.

$$\begin{aligned}x &> 5 \\y &< 2\end{aligned}$$

Which graph could represent this part of linear function  $r$ ?



### Data Analysis

Item	State	Local
A	23	
B*	34	
C	24	
D	18	

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

\*Correct Answer (B)

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
F	9	
G*	64	
H	6	
J	21	

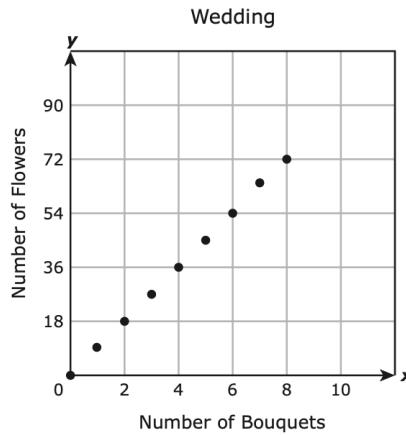
### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

! 2022 – Q18

- 18** A florist is making bouquets of flowers for a wedding. Each bouquet will have 9 flowers. The graph shows the linear relationship between  $y$ , the number of flowers used, and  $x$ , the number of bouquets.



The florist will use no more than 8 bouquets for the wedding. Which set best represents the domain of the function for this situation?

- F**  $\{0, 2, 4, 6, 8, 10\}$   
**G**  $\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$   
**H**  $\{0, 18, 36, 54, 72, 90\}$   
**J**  $\{0, 9, 18, 27, 36, 45, 54, 63, 72\}$

\*Correct Answer (G)

**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

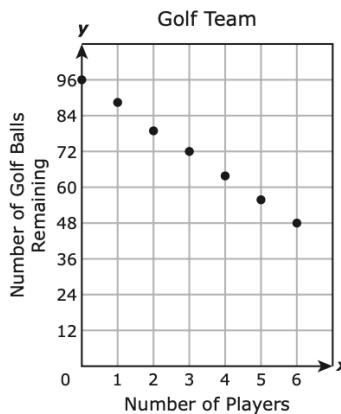
### Data Analysis

Item	State	Local
A	12	
B	7	
C*	70	
D	10	

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications



The coach will use no more than 6 players on the school's golf team. Which set best represents the range of the function for this situation?

- A** {96, 84, 72, 60, 48, 36, 24}
- B** {8, 9, 10, 11, 12, 13, 14}
- C** {96, 88, 80, 72, 64, 56, 48}
- D** {0, 1, 2, 3, 4, 5, 6}

\*Correct Answer (C)

## IQ Analysis | Investigating the Question

A.2(B)

RC 3

**A.2(B)** write linear equations in two variables in various forms, including  $y = mx + b$ ,  $Ax + By = C$ , and  $y - y_1 = m(x - x_1)$ , given one point and the slope and given two points

2025 – Q8

What is the equation in slope-intercept form of the line that has a slope of  $-\frac{2}{11}$  and passes through the point  $(22, 5)$ ?

A  $y = -\frac{2}{11}x + 9$

B  $y = -\frac{2}{11}x + 1$

C  $y = -\frac{2}{11}x - 9$

D  $y = -\frac{2}{11}x - 1$

\*Correct Answer (A)

## Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

## Data Analysis

Item	State	Local
A*	66	
B		
C		
D		

## Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

Learning from Mistakes  
Instructional Implications

**A.2(B)** write linear equations in two variables in various forms, including  $y = mx + b$ ,  $Ax + By = C$ , and  $y - y_1 = m(x - x_1)$ , given one point and the slope and given two points

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Stimulus	

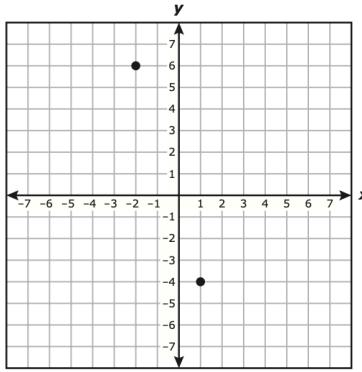
### Data Analysis

Item	State	Local
A	10	
B	22	
C	14	
D*	54	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications



Which equation in slope-intercept form best represents the line that passes through these two points?

- A**  $y = -\frac{2}{3}x - \frac{11}{3}$
- B**  $y = -\frac{11}{3}x - \frac{2}{3}$
- C**  $y = -\frac{2}{3}x - \frac{10}{3}$
- D**  $y = -\frac{10}{3}x - \frac{2}{3}$

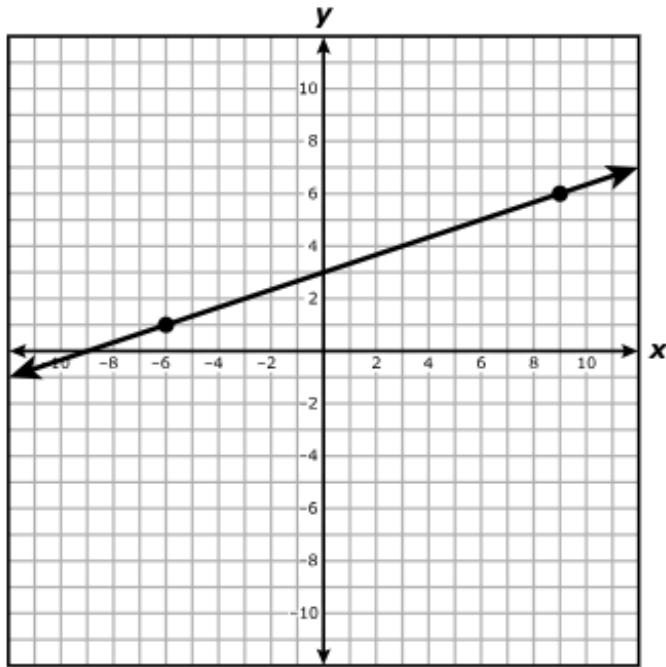
\*Correct Answer (D)

A.2(C) write linear equations in two variables given a table of values, a graph, and a verbal description		Analysis of Assessed Standards	
2025 – Q6		Cluster	Linear Functions
The table represents some points on the graph of linear function $f$ .		Subcluster	Writing Linear Equations
		Content	Readiness
		Process	
		Item Type	Drag and Drop (2 pts)
		Stimulus	
Data Analysis			
	Item	State	Local
	Full Credit	51	
	No Credit	29	
	Partial Credit	2	
Error Analysis			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
Learning from Mistakes Instructional Implications			
*Correct Answer (3/2; -1)			

**A.2(C)** write linear equations in two variables given a table of values, a graph, and a verbal description

2025 – Q42

The graph of a linear function is shown on the grid.



Which equation is best represented by this graph?

(A)  $y = 3(x + 1)$

(B)  $y = 3(x + 3)$

(C)  $y = \frac{1}{3}(x + 9)$

(D)  $y = \frac{1}{3}(x + 3)$

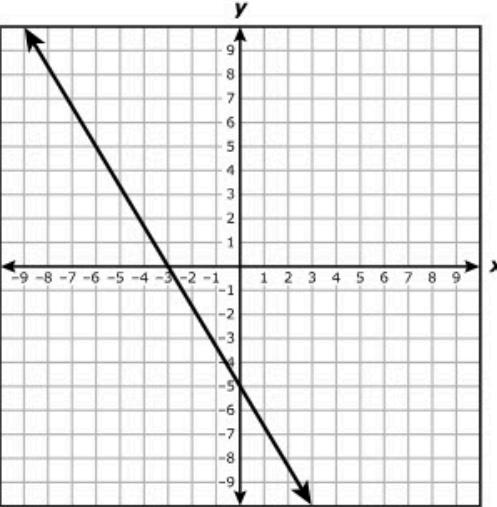
\*Correct Answer (C)

Analysis of Assessed Standards	
Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

Data Analysis		
Item	State	Local
A		
B		
C*	67	
D		

Error Analysis	
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early

Learning from Mistakes Instructional Implications	

<b>A.2(C)</b> write linear equations in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>			
2024 – Q14		<b>Cluster</b>	Linear Functions		
The graph of a linear function is shown.		<b>Subcluster</b>	Writing Linear Equations		
		<b>Content</b>	Readiness		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
A					
B					
C*	72				
D					
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b>					
<b>Instructional Implications</b>					
*					
Correct Answer (C)					

<b>A.2(C)</b> write linear equations in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>	
2024 – Q36		<b>Cluster</b>	Linear Functions
The total cost, $y$ , for $x$ tickets to a concert includes a flat fee for processing and a cost per ticket. One customer purchased 4 tickets for a total cost of \$160. Another customer purchased 8 tickets for a total cost of \$300.		<b>Subcluster</b>	Writing Linear Equations
Which linear equation represents the total cost in dollars, $y$ , for $x$ tickets?		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A		
	B		
	C*	53	
	D		
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (C)

<b>A.2(C)</b> write linear equations in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>									
2023 – Q1	The table represents some points on the graph of a linear function.	<b>Cluster</b>	Linear Functions								
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>x</th> <th>y</th> </tr> <tr> <td>-4</td> <td>10</td> </tr> <tr> <td>-2</td> <td>7</td> </tr> <tr> <td>6</td> <td>-5</td> </tr> </table>	x	y	-4	10	-2	7	6	-5	<b>Subcluster</b>	Writing Linear Equations
x	y										
-4	10										
-2	7										
6	-5										
		<b>Content</b>	Readiness								
		<b>Process</b>									
		<b>Item Type</b>	Multiple Choice (1 pt)								
		<b>Stimulus</b>									
<b>Data Analysis</b>											
Item State Local											
A*	76										
B	11										
C	9										
D	4										
<b>Error Analysis</b>											
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts											
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early											
<b>Learning from Mistakes</b> <b>Instructional Implications</b>											

\*Correct Answer (A)

<b>A.2(C)</b> write linear equations in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>			
2023 – Q34	Printer ink costs \$18.99 per cartridge. The company that sells the ink cartridges charges a flat rate shipping fee of \$7.95, no matter the number of cartridges purchased in a single order.	<b>Cluster</b>	Linear Functions		
	Which linear function models the total cost, $t$ , for a single order of $c$ cartridges?	<b>Subcluster</b>	Writing Linear Equations		
	<input type="radio"/> A $c = 26.94t$	<b>Content</b>	Readiness		
	<input type="radio"/> B $c = 18.99t + 7.95$	<b>Process</b>			
	<input type="radio"/> C $t = 26.94c$	<b>Item Type</b>	Multiple Choice (1 pt)		
	<input type="radio"/> D $t = 18.99c + 7.95$	<b>Stimulus</b>			
<b>Data Analysis</b>					
Item State Local					
A	10				
B	22				
C	13				
D*	54				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts					
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early					
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					

\*Correct Answer (D)

A.2(C) write linear equations in two variables given a table of values, a graph, and a verbal description		Analysis of Assessed Standards		
2022 – Q15		Cluster	Linear Functions	
15 The graph of a linear function is shown on the grid.		Subcluster	Writing Linear Equations	
		Content	Readiness	
		Process		
		Stimulus		
Data Analysis				
Item	State	Local		
A	15			
B*	71			
C	8			
D	6			
Error Analysis				
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early			
Learning from Mistakes Instructional Implications				

<p><b>A.2(C)</b> write linear equations in two variables given a table of values, a graph, and a verbal description</p> <p>2022 – Q38</p> <p><b>38</b> The conversion of degrees Celsius to degrees Fahrenheit can be represented by a linear relationship. The graph shows the linear relationship between <math>y</math>, the temperature in degrees Fahrenheit, and <math>x</math>, the temperature in degrees Celsius from the freezing point of water.</p> <p>Which equation best represents this situation?</p> <p><b>F</b> <math>y = \frac{5}{9}x</math></p> <p><b>G</b> <math>y = \frac{9}{5}x</math></p> <p><b>H</b> <math>y = \frac{5}{9}x + 32</math></p> <p><b>J</b> <math>y = \frac{9}{5}x + 32</math></p> <p>*Correct Answer (J)</p>	<table border="1"> <thead> <tr> <th colspan="3">Analysis of Assessed Standards</th> </tr> </thead> <tbody> <tr> <td>Cluster</td><td colspan="2">Linear Functions</td></tr> <tr> <td>Subcluster</td><td colspan="2">Writing Linear Equations</td></tr> <tr> <td>Content</td><td colspan="2">Readiness</td></tr> <tr> <td>Process</td><td colspan="2"></td></tr> <tr> <td>Stimulus</td><td colspan="2"></td></tr> <tr> <th colspan="3">Data Analysis</th> </tr> <tr> <th>Item</th><th>State</th><th>Local</th></tr> <tr> <td>F</td><td>9</td><td></td></tr> <tr> <td>G</td><td>12</td><td></td></tr> <tr> <td>H</td><td>25</td><td></td></tr> <tr> <td>J*</td><td>53</td><td></td></tr> <tr> <th colspan="3">Error Analysis</th> </tr> <tr> <td><input type="checkbox"/> Guessing</td><td><input type="checkbox"/> Mixed Up Concepts</td></tr> <tr> <td><input type="checkbox"/> Careless Error</td><td><input type="checkbox"/> Stopped Too Early</td></tr> <tr> <th colspan="3">Learning from Mistakes Instructional Implications</th></tr> </tbody> </table>	Analysis of Assessed Standards			Cluster	Linear Functions		Subcluster	Writing Linear Equations		Content	Readiness		Process			Stimulus			Data Analysis			Item	State	Local	F	9		G	12		H	25		J*	53		Error Analysis			<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	Learning from Mistakes Instructional Implications		
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<b>A.2(D) write and solve equations involving direct variation</b>		<b>Analysis of Assessed Standards</b>							
2024 – Q3		<b>Cluster</b>	Linear Functions						
The value of $y$ varies directly with $x$ . When the value of $x$ is 4, the value of $y$ is -12.		<b>Subcluster</b>	Solving Linear Equations						
What is the constant of variation when $y$ is a function of $x$ , and what is the value of $y$ when $x = -6$ ?		<b>Content</b>	Supporting						
Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.		<b>Process</b>							
		<b>Item Type</b>	Drag and Drop (2 pts)						
		<b>Stimulus</b>							
<b>Data Analysis</b>									
Item	State	Local							
Full Credit	26								
No Credit	47								
Partial Credit	27								
<b>Error Analysis</b>									
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts								
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early								
<b>Learning from Mistakes</b>									
<b>Instructional Implications</b>									

\*Correct Answer (-3; 18)

<b>A.2(D)</b> write and solve equations involving direct variation		<b>Analysis of Assessed Standards</b>	
2022 – Q7		<b>Cluster</b>	Linear Functions
<b>7</b> The value of $y$ is directly proportional to the value of $x$ . When $x = 512$ , $y = 128$ .		<b>Subcluster</b>	Solving Linear Equations
What is the value of $y$ when $x = 64$ ?		<b>Content</b>	Supporting
<b>A</b> 256		<b>Process</b>	
<b>B</b> 32		<b>Stimulus</b>	
<b>C</b> 16		<b>Data Analysis</b>	
<b>D</b> 8		<b>Item</b>	<b>State</b>
*Correct Answer (C)		A	13
		B	17
		C*	57
		D	12
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes Instructional Implications</b>	

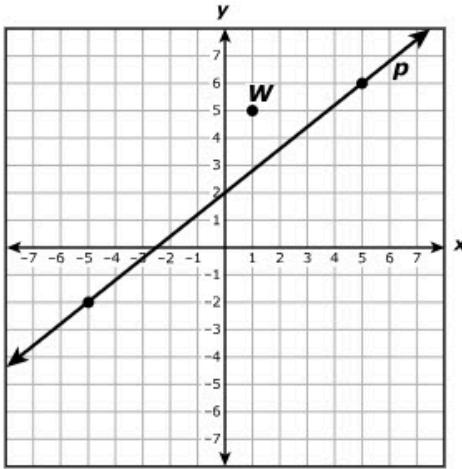
<b>A.2(E)</b> write the equation of a line that contains a given point and is parallel to a given line		<b>Analysis of Assessed Standards</b>			
2025 – Q22		<b>Cluster</b>	Linear Functions		
The equation of line $n$ is $y = -\frac{3}{5}x + 6$ . Line $p$ is parallel to line $n$ and passes through the point $(15, -6)$ .		<b>Subcluster</b>	Writing Linear Equations		
What is the equation of line $p$ in slope-intercept form? Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.		<b>Content</b>	Supporting		
<input type="button" value="-31"/> <input type="button" value="-15"/> <input type="button" value="−&lt;math&gt;\frac{5}{3}&lt;/math&gt;"/> <input type="button" value="−&lt;math&gt;\frac{3}{5}&lt;/math&gt;"/> <input type="button" value="−&lt;math&gt;\frac{3}{5}&lt;/math&gt;"/> <input type="button" value="−&lt;math&gt;\frac{5}{3}&lt;/math&gt;"/> <input type="button" value="3"/> <input type="button" value="19"/>		<b>Process</b>			
$y = \boxed{\phantom{00}}x + \boxed{\phantom{00}}$		<b>Item Type</b>	Drag and Drop (2 pts)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
Item	State	Local			
Full Credit	45				
No Credit	31				
Partial Credit	24				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts				
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early				
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					

\*Correct Answer (- 3/5; 3)

**A.2(E)** write the equation of a line that contains a given point and is parallel to a given line

2024 – Q28

The graph shows point  $W$  and line  $p$ .



Which equation best represents the point-slope form of the line that passes through point  $W$  and is parallel to line  $p$ ?

(A)  $y - 5 = -\frac{4}{5}(x - 1)$

(B)  $y - 5 = \frac{4}{5}(x - 1)$

(C)  $y - 5 = -\frac{5}{4}(x - 1)$

(D)  $y - 5 = \frac{5}{4}(x - 1)$

\*Correct Answer (B)

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A		
B*	50	
C		
D		

### Error Analysis

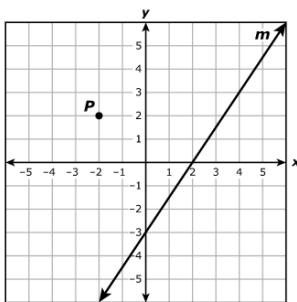
- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.2(E)** write the equation of a line that contains a given point and is parallel to a given line

! 2023 – Q44

The graph shows point  $P$  and line  $m$ .



Which equation best represents the slope-intercept form of the line that passes through point  $P$  and is parallel to line  $m$ ?

(A)  $y = \frac{3}{2}x - 5$

(B)  $y = -\frac{2}{3}x + \frac{2}{3}$

(C)  $y = \frac{3}{2}x + 5$

(D)  $y = -\frac{2}{3}x - \frac{2}{3}$

\*Correct Answer (C)

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A	16	
B	20	
C*	58	
D	7	

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

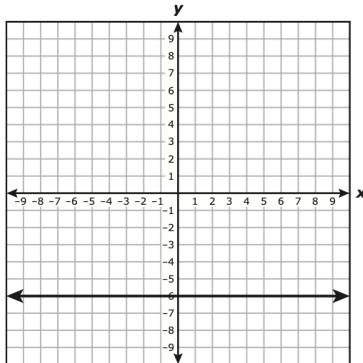
### Learning from Mistakes Instructional Implications

<b>A.2(G)</b> write an equation of a line that is parallel or perpendicular to the x- or y- axis and determine whether the slope of the line is zero or undefined	<b>Analysis of Assessed Standards</b>		
<b>2023 – Q21</b>	<b>Cluster</b>	Linear Functions	
	<b>Subcluster</b>	Writing Linear Equations	
	<b>Content</b>	Supporting	
	<b>Process</b>		
	<b>Item Type</b>	Multiple Choice (1 pt)	
	<b>Stimulus</b>		
	<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>	<b>Local</b>
	<b>A*</b>	<b>72</b>	
	<b>B</b>	<b>7</b>	
	<b>C</b>	<b>10</b>	
	<b>D</b>	<b>11</b>	
	<b>Error Analysis</b>		
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>		
<b>*Correct Answer (A)</b>			

**A.2(G)** write an equation of a line that is parallel or perpendicular to the x- or y- axis and determine whether the slope of the line is zero or undefined

2022 – Q35

**35** Which equation best represents the line shown on the grid?



- A**  $y = 0$
- B**  $y = -6$
- C**  $x = 0$
- D**  $x = -6$

\*Correct Answer (B)

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Stimulus	

### Data Analysis

Item	State	Local
A	5	
B*	76	
C	7	
D	12	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error       Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.3(A)** determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including  $y = mx + b$ ,  $Ax + By = C$ , and  $y - y_1 = m(x - x_1)$

2025 – Q27

The table shows four points on the graph of a linear function.

x	y
-4	23
-1	15
2	7
5	-1

What is the slope of the line represented in the table?

(A)  $\frac{8}{3}$

(B)  $-\frac{8}{3}$

(C)  $\frac{3}{8}$

(D)  $-\frac{3}{8}$

\* Correct Answer (B)

#### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

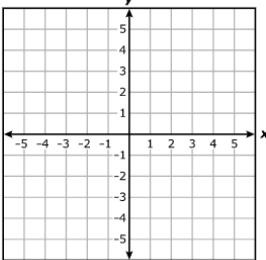
#### Data Analysis

Item	State	Local
A		
B*	67	
C		
D		

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<b>A.3(A)</b> determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$ , $Ax + By = C$ , and $y - y_1 = m(x - x_1)$	<b>Analysis of Assessed Standards</b>					
2023 – Q28	<b>Cluster</b>	Linear Functions				
A line contains the points $(-2, -2)$ and $(4, 2)$ .	<b>Subcluster</b>	Writing Linear Equations				
	<b>Content</b>	Supporting				
	<b>Process</b>					
	<b>Item Type</b>	Multiple Choice (1 pt)				
	<b>Stimulus</b>					
	<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>			
	A	16				
	B	18				
	C*	58				
	D	7				
<b>Error Analysis</b>						
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts					
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early					
<b>Learning from Mistakes</b>						
<b>Instructional Implications</b>						

\*Correct Answer (C)

<b>A.3(A)</b> determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$ , $Ax + By = C$ , and $y - y_1 = m(x - x_1)$	<b>Analysis of Assessed Standards</b>																	
<p>2022 – Q48</p> <p><b>48</b> The graph of a line passes through the points <math>(-3, 1)</math> and <math>(5, 8)</math>.</p>	<b>Cluster</b> Linear Functions <b>Subcluster</b> Writing Linear Equations <b>Content</b> Supporting <b>Process</b> <b>Stimulus</b>																	
	<b>Data Analysis</b> <table border="1"> <thead> <tr> <th>Item</th> <th>State</th> <th>Local</th> </tr> </thead> <tbody> <tr> <td>F</td> <td>13</td> <td></td> </tr> <tr> <td>G*</td> <td>65</td> <td></td> </tr> <tr> <td>H</td> <td>12</td> <td></td> </tr> <tr> <td>J</td> <td>9</td> <td></td> </tr> </tbody> </table>	Item	State	Local	F	13		G*	65		H	12		J	9			
Item	State	Local																
F	13																	
G*	65																	
H	12																	
J	9																	
<p>What is the slope of the line?</p> <p><b>F</b> <math>\frac{9}{2}</math></p> <p><b>G</b> <math>\frac{7}{8}</math></p> <p><b>H</b> <math>-\frac{9}{2}</math></p> <p><b>J</b> <math>-\frac{7}{8}</math></p> <p>*Correct Answer (G)</p>	<b>Error Analysis</b> <p><input type="checkbox"/> Guessing      <input type="checkbox"/> Mixed Up Concepts</p> <p><input type="checkbox"/> Careless Error    <input type="checkbox"/> Stopped Too Early</p> <b>Learning from Mistakes</b> <b>Instructional Implications</b>																	

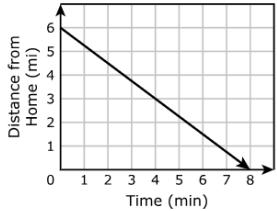
## IQ Analysis | Investigating the Question

A.3(B)

RC 2

<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems		<b>Analysis of Assessed Standards</b>			
2025 – Q13		<b>Cluster</b>	Linear Functions		
Which value represents the rate of change of $y$ with respect to $x$ for this function?		<b>Subcluster</b>	Writing Linear Equations		
$x + 7y = -14$		<b>Content</b>	Readiness		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
(A) $-7$	A				
(B) $7$	B				
(C) $-\frac{1}{7}$	C*	48			
(D) $\frac{1}{7}$	D				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					

\*Correct Answer (C)

<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems	<b>Analysis of Assessed Standards</b>	
2025 – Q50	<b>Cluster</b>	Linear Functions
The graph shows a student's distance from home as a function of time.	<b>Subcluster</b>	Writing Linear Equations
Going Home	<b>Content</b>	Readiness
Distance from Home (mi)	<b>Process</b>	
	<b>Item Type</b>	Multiple Choice (1 pt)
Time (min)	<b>Stimulus</b>	

<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems		<b>Analysis of Assessed Standards</b>			
<b>!</b>	2024 – Q7	<b>Cluster</b>	Linear Functions		
	The graph of a line is represented by the equation $5x - 8y = 40$ . Which value represents the rate of change of $y$ with respect to $x$ for the equation?	<b>Subcluster</b>	Writing Linear Equations		
		<b>Content</b>	Readiness		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
	A				
	B				
	C*	43			
	D				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b>					
<b>Instructional Implications</b>					

\*Correct Answer (C)

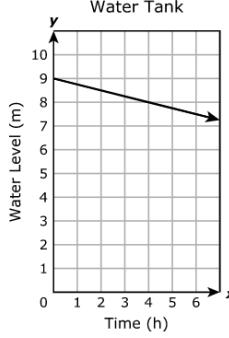
<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems		<b>Analysis of Assessed Standards</b>								
2024 – Q30	Cluster	Linear Functions								
The altitude of an airplane is changing at a constant rate. The table shows the linear relationship between $y$ , the altitude of the airplane in feet, and $x$ , the time in minutes.	Subcluster	Writing Linear Equations								
<b>Airplane's Altitude</b>	Content	Readiness								
<table border="1"> <thead> <tr> <th>Time, <math>x</math> (minutes)</th> <th>Altitude, <math>y</math> (feet)</th> </tr> </thead> <tbody> <tr> <td>1.5</td> <td>25,500</td> </tr> <tr> <td>3.25</td> <td>20,250</td> </tr> <tr> <td>6</td> <td>12,000</td> </tr> </tbody> </table>	Time, $x$ (minutes)	Altitude, $y$ (feet)	1.5	25,500	3.25	20,250	6	12,000	Process	
Time, $x$ (minutes)	Altitude, $y$ (feet)									
1.5	25,500									
3.25	20,250									
6	12,000									
	Item Type	Inline Choice (2 pts)								
	Stimulus									
<b>Data Analysis</b>										
	Item	State	Local							
	Full Credit	43								
	No Credit	10								
	Partial Credit	47								
<b>Error Analysis</b>										
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts								
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early								
<b>Learning from Mistakes</b> <b>Instructional Implications</b>										

Complete the statement that describes the rate of change of the altitude of the airplane with respect to time.

Choose the correct answer from each drop-down menu to complete the sentence.

The altitude of the airplane   at a rate of   feet per minute.

\*Correct Answer (decreases; 3,000)

<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems	<b>Analysis of Assessed Standards</b>		
2023 – Q2	<b>Cluster</b>	Linear Functions	
The water level in a tank is changing at a constant rate. The graph shows the relationship between time in hours, $x$ , and the water level in meters, $y$ .	<b>Subcluster</b>	Writing Linear Equations	
	<b>Content</b>	Readiness	
	<b>Process</b>		
	<b>Item Type</b>	Drag and Drop (2 pts)	
	<b>Stimulus</b>		
	<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>	<b>Local</b>
	<b>Full Credit</b>	70	
	<b>No Credit</b>	3	
	<b>Partial Credit</b>	27	
	<b>Error Analysis</b>		
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
	<b>Learning from Mistakes</b>		
	<b>Instructional Implications</b>		

\*Correct Answer (Decreases, 0.25)

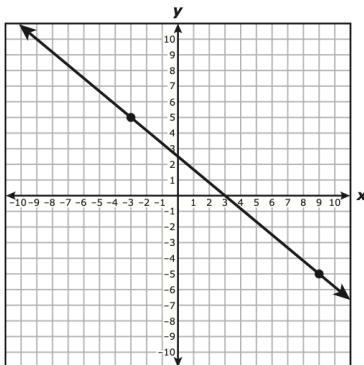
<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
2023 – Q50		<b>Cluster</b>	Linear Functions
A construction worker built steps up to a home. The table shows the linear relationship between the height off the ground in inches and the number of steps.		<b>Subcluster</b>	Writing Linear Equations
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		A	15
		B	10
		C*	70
		D	4
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b>	
		<b>Instructional Implications</b>	
What is the rate of change of height off the ground with respect to the number of steps?			
<input checked="" type="radio"/> A 14 in. per step <input type="radio"/> B $\frac{1}{7}$ in. per step <input type="radio"/> C 7 in. per step <input type="radio"/> D $\frac{1}{14}$ in. per step			
*Correct Answer (C)			

<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
2022 – Q2		<b>Cluster</b>	Linear Functions
2 A worker is packing items in boxes. The table shows the linear relationship between the number of items the worker has packed in boxes after different amounts of time.		<b>Subcluster</b>	Writing Linear Equations
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		F	6
		G	4
		H*	87
		J	4
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b>	
		<b>Instructional Implications</b>	
Which statement describes the rate of change of the number of items the worker packed in boxes with respect to the number of minutes the worker has been packing items in boxes?			
<input type="radio"/> F The worker packed 8 items in boxes per minute. <input type="radio"/> G The worker packed 37 items in boxes per minute. <input type="radio"/> H The worker packed 4 items in boxes per minute. <input type="radio"/> J The worker packed 15 items in boxes per minute.			
*Correct Answer (H)			

**A.3(B)** calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems

2022 – Q19

- 19** The graph of a line is shown on the grid. The coordinates of both points indicated on the graph of the line are integers.



What is the rate of change of  $y$  with respect to  $x$  for this line?

- A**  $\frac{5}{2}$
- B**  $-\frac{6}{5}$
- C**  $\frac{2}{3}$
- D**  $-\frac{5}{6}$

\*Correct Answer (D)

#### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Writing Linear Equations
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
A	15	
B	15	
C	13	
D*	57	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

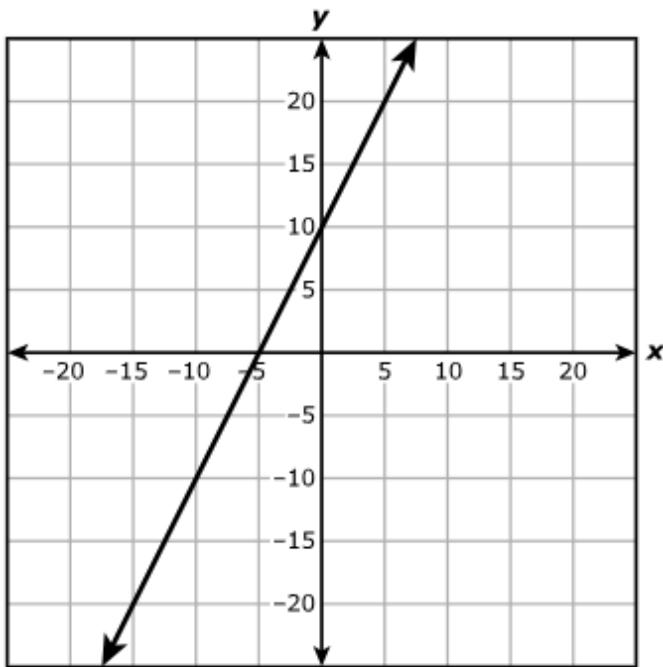
#### Learning from Mistakes Instructional Implications

<b>A.3(B)</b> calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems	<b>Analysis of Assessed Standards</b>														
2022 – Q34  <b>34</b> The table shows the linear relationship between the distance in feet below sea level and the time in seconds traveled by a submarine. <p style="text-align: center;">Submarine</p> <table border="1"> <thead> <tr> <th>Time (seconds)</th><th>Distance Below Sea Level (feet)</th></tr> </thead> <tbody> <tr> <td>0</td><td>460</td></tr> <tr> <td>18</td><td>604</td></tr> <tr> <td>34</td><td>732</td></tr> <tr> <td>52</td><td>876</td></tr> <tr> <td>70</td><td>1,020</td></tr> </tbody> </table> <p>What is the rate of change of the distance in feet below sea level with respect to time that the submarine traveled?</p> <p>Record your answer and fill in the bubbles on your answer document.</p>	Time (seconds)	Distance Below Sea Level (feet)	0	460	18	604	34	732	52	876	70	1,020	<b>Cluster</b>	Linear Functions	
Time (seconds)	Distance Below Sea Level (feet)														
0	460														
18	604														
34	732														
52	876														
70	1,020														
	<b>Subcluster</b>	Writing Linear Equations													
	<b>Content</b>	Readiness													
	<b>Process</b>														
	<b>Stimulus</b>														
	<b>Data Analysis</b>														
	<b>Item</b>	<b>State</b>	<b>Local</b>												
	8	49*													
		50													
<b>*Correct Answer (8)</b>	<b>Error Analysis</b>														
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts													
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early													
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>														

**A.3(C)** graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems

2025 – Q19

A graph of a linear function is shown.



Which value best represents the zero of the function?

(A) 2

(B) 10

(C) -5

(D) -2

\*Correct Answer (C)

#### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Describing Linear Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C*	77	
D		

#### Error Analysis

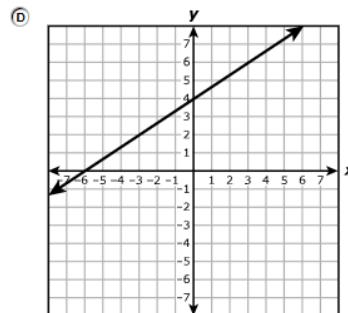
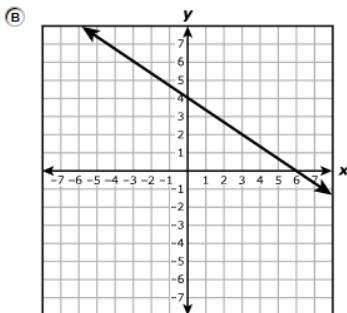
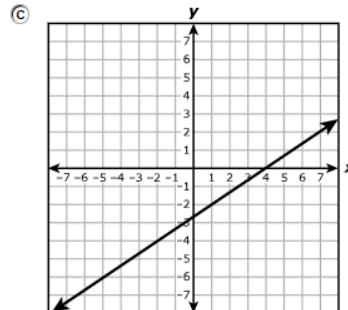
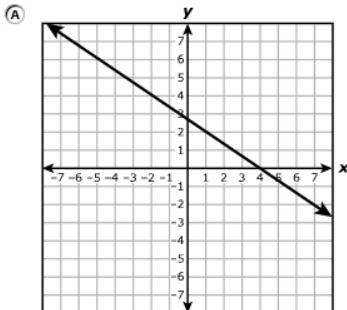
- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.3(C)** graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems

2025 – Q35

Which graph best represents a line that has a slope of  $\frac{2}{3}$  and a y-intercept of 4?



\* Correct Answer (D)

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Describing Linear Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A		
B		
C		
D*	61	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

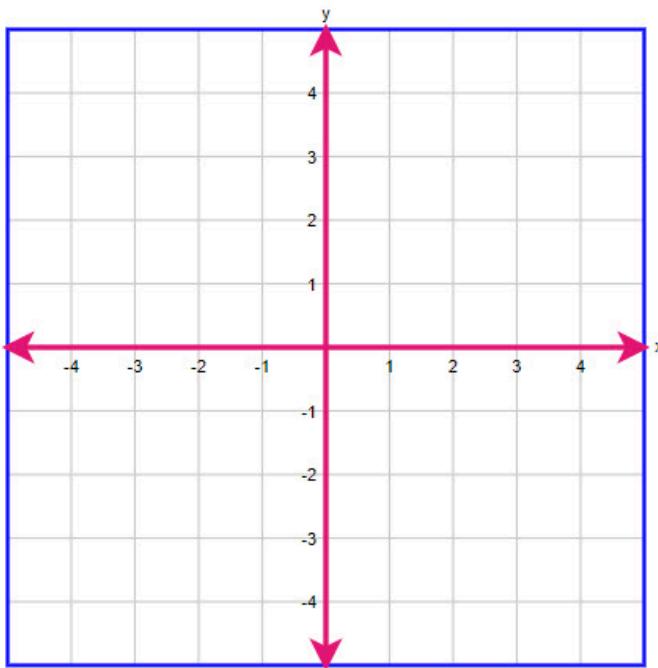
### Learning from Mistakes Instructional Implications

**A.3(C)** graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems

! 2024 – Q22

Graph the line represented by the equation  $2x + 3y = 6$ .

Select two points on the coordinate grid. A line will connect the points.



\* Correct Answer (A line going through (0, 2) and (3, 0))

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Describing Linear Functions
Content	Readiness
Process	
Item Type	Graphing (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
Full Credit	35	
No Credit	65	

### Error Analysis

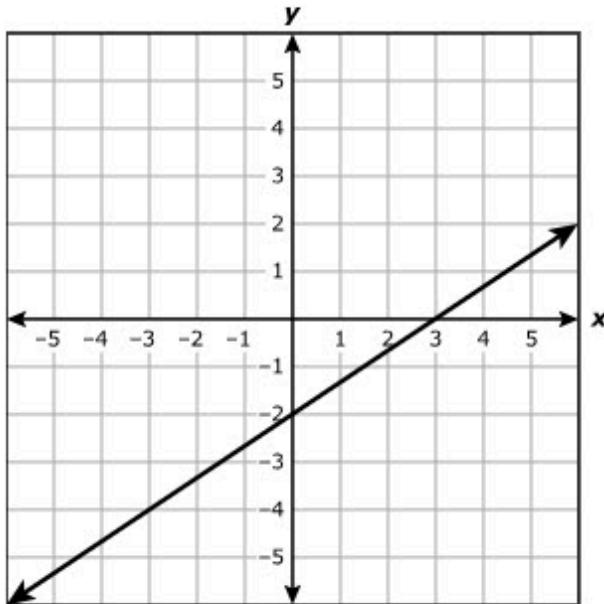
- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.3(C)** graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems

2024 – Q50

The graph of a linear function is shown on the grid.



What value best represents the y-intercept of the line?

(A)  $-2$

(B)  $-\frac{3}{2}$

(C)  $\frac{2}{3}$

(D)  $3$

\*Correct Answer (A)

### Analysis of Assessed Standards

**Cluster** Linear Functions

**Subcluster** Describing Linear Functions

**Content** Readiness

**Process**

**Item Type** Multiple Choice (1 pt)

**Stimulus**

### Data Analysis

**Item**

**State**

**Local**

A\*

78

B

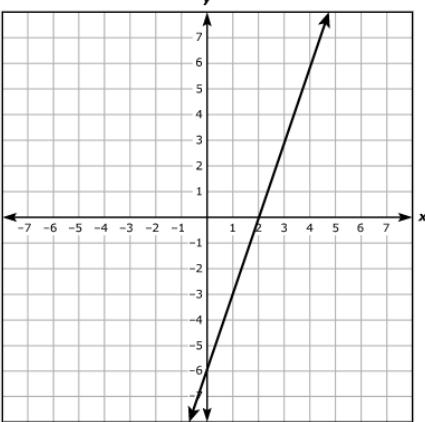
C

D

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.3(C)</b> graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems	<b>Analysis of Assessed Standards</b>				
2023 – Q22	<b>Cluster</b>	Linear Functions			
The graph of a linear function, $f$ , is shown.	<b>Subcluster</b>	Describing Linear Functions			
	<b>Content</b>	Readiness			
The graph of a linear function, $f$ , is shown.	<b>Process</b>				
What is the zero of $f$ ?	<b>Item Type</b>	Multiple Choice (1 pt)			
The graph of a linear function, $f$ , is shown.	<b>Stimulus</b>				
<b>Data Analysis</b>					
<b>Item</b>	<b>State</b>	<b>Local</b>			
A	5				
B	6				
C*	74				
D	15				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts					
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early					
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					
*Correct Answer (C)					

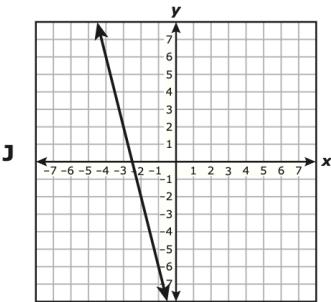
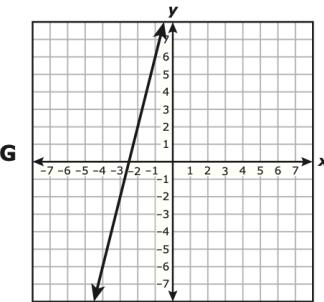
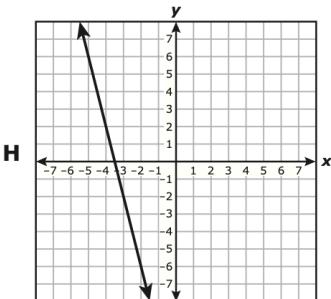
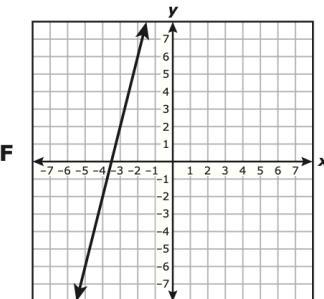
<b>A.3(C)</b> graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems	<b>Analysis of Assessed Standards</b>		
2023 – Q48	<b>Cluster</b>	Linear Functions	
	<b>Subcluster</b>	Describing Linear Functions	
	<b>Content</b>	Readiness	
	<b>Process</b>		
	<b>Item Type</b>	Multiple Choice (1 pt)	
	<b>Stimulus</b>		
	<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	11	
	B	7	
	C*	78	
	D	4	
	<b>Error Analysis</b>		
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

\*Correct Answer (C)

**A.3(C)** graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems

2022 – Q32

**32** Which graph best represents  $y = -4(x + 3) - 2$ ?



\*Correct Answer (H)

### Analysis of Assessed Standards

**Cluster** Linear Functions

**Subcluster** Describing Linear Functions

**Content** Readiness

**Process**

**Stimulus**

### Data Analysis

Item	State	Local
F	11	
G	8	
H*	69	
J	12	

### Error Analysis

Guessing       Mixed Up Concepts

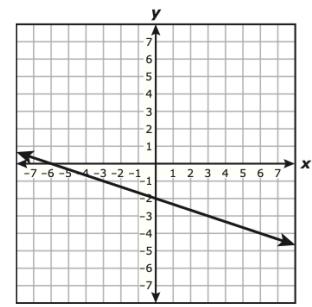
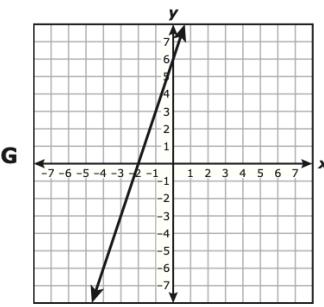
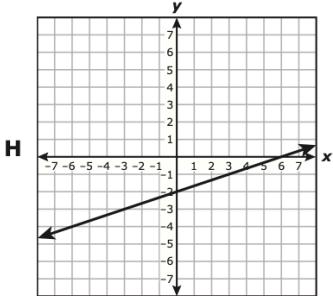
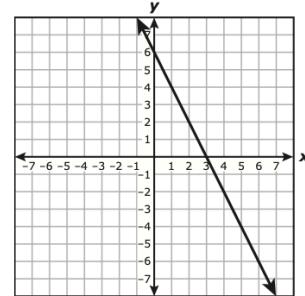
Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.3(C)** graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems

2022 – Q54

- 54** Linear function  $k$  has a zero of  $-2$  and a  $y$ -intercept of  $6$ . Which graph best represents  $k$ ?



\*Correct Answer (G)

### Analysis of Assessed Standards

**Cluster** Linear Functions

**Subcluster** Describing Linear Functions

**Content** Readiness

**Process**

**Stimulus**

### Data Analysis

Item	State	Local
<b>F</b>	<b>10</b>	
<b>G*</b>	<b>75</b>	
<b>H</b>	<b>9</b>	
<b>J</b>	<b>5</b>	

## IQ Analysis | Investigating the Question

A.3(E)

RC 2

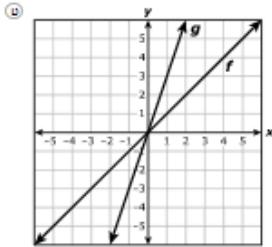
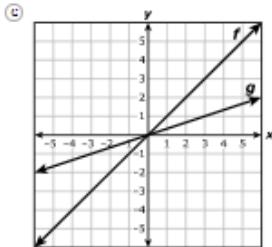
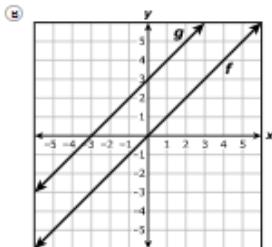
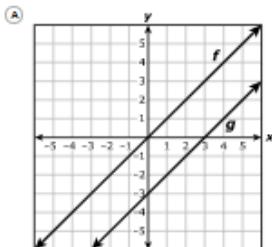
<b>A.3(E)</b> determine the effects on the graph of the parent function $f(x) = x$ when $f(x)$ is replaced by $af(x)$ , $f(x) + d$ , $f(x - c)$ , $f(bx)$ for specific values of $a$ , $b$ , $c$ , and $d$		<b>Analysis of Assessed Standards</b>
2024 – Q38	<b>Cluster</b>	Linear Functions
The graph of $f(x) = x$ is transformed to create the graph of $g(x) = \frac{1}{2}f(x) + 3$ . Complete the statement to compare the graphs of $f$ and $g$ .	<b>Subcluster</b>	Describing Linear Functions
Choose the correct answer from each drop-down menu to complete the sentence.	<b>Content</b>	Supporting
The graph of $g$ is <input type="text"/> the graph of $f$ and has a $y$ -intercept that is <input type="text"/> that of $f$ .	<b>Process</b>	
	<b>Item Type</b>	Inline Choice (2 pts)
	<b>Stimulus</b>	
<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>
	Full Credit	44
	No Credit	18
	Partial Credit	38
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

\*Correct Answer (less steep than; greater than)

**A.3(E)** determine the effects on the graph of the parent function  $f(x) = x$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

! 2023 – Q15

The graph of the function  $f(x) = x$  is transformed to form function  $g(x)$  such that  $g(x) = 3f(x)$ . Which graph represents  $f$  and  $g$ ?



\*Correct Answer (D)

### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Describing Linear Functions
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A	23	
B	20	
C	12	
D*	44	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

## IQ Analysis | Investigating the Question

A.4(A)

RC 2

<b>A.4(A)</b> calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association		<b>Analysis of Assessed Standards</b>	
2025 – Q7		<b>Cluster</b>	Linear Functions
A student used a checking account to pay for living expenses during the first two years of college. The table shows the amount the student had in the account after different numbers of months had passed.		<b>Subcluster</b>	Describing Linear Functions
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A		
	B		
	C*	48	
	D		
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

**\*Correct Answer (C)**

<b>A.4(A)</b> calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association	<b>Analysis of Assessed Standards</b>																	
2024 – Q10	<b>Cluster</b>	Linear Functions																
A counselor asked college students who had jobs how many hours they worked each week. The counselor then compared the number of hours each student worked and the student's overall grade average. The table shows the data.	<b>Subcluster</b>	Describing Linear Functions																
<b>Weekly Hours and Grade Average</b>	<b>Content</b>	Supporting																
<table border="1"> <thead> <tr> <th>Hours Worked</th> <th>Overall Grade Average</th> </tr> </thead> <tbody> <tr> <td>15</td> <td>86</td> </tr> <tr> <td>30</td> <td>72</td> </tr> <tr> <td>27</td> <td>77</td> </tr> <tr> <td>25</td> <td>83</td> </tr> <tr> <td>16</td> <td>87</td> </tr> <tr> <td>20</td> <td>90</td> </tr> <tr> <td>12</td> <td>94</td> </tr> </tbody> </table>	Hours Worked	Overall Grade Average	15	86	30	72	27	77	25	83	16	87	20	90	12	94	<b>Process</b>	
Hours Worked	Overall Grade Average																	
15	86																	
30	72																	
27	77																	
25	83																	
16	87																	
20	90																	
12	94																	
	<b>Item Type</b>	Multiple Choice (1 pt)																
	<b>Stimulus</b>																	
	<b>Data Analysis</b>																	
	<b>Item</b>	<b>State</b>																
(A) Strong negative	A*	34																
(B) Weak negative																		
(C) Weak positive																		
(D) Strong positive																		
	<b>Error Analysis</b>																	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts																
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early																
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>																	
*Correct Answer (A)																		

<b>A.4(A)</b> calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association	<b>Analysis of Assessed Standards</b>																	
<b>!</b> 2023 – Q6	<b>Cluster</b>	Linear Functions																
The table shows the number of species added to the United States endangered species list each year for several years. A linear function can be used to model the data.	<b>Subcluster</b>	Describing Linear Functions																
<b>Endangered Species</b>	<b>Content</b>	Supporting																
<table border="1"> <thead> <tr> <th>Year</th><th>Number of Species Added</th></tr> </thead> <tbody> <tr><td>2011</td><td>19</td></tr> <tr><td>2012</td><td>51</td></tr> <tr><td>2013</td><td>89</td></tr> <tr><td>2014</td><td>66</td></tr> <tr><td>2015</td><td>31</td></tr> <tr><td>2016</td><td>74</td></tr> <tr><td>2017</td><td>11</td></tr> </tbody> </table>	Year	Number of Species Added	2011	19	2012	51	2013	89	2014	66	2015	31	2016	74	2017	11	<b>Process</b>	
Year	Number of Species Added																	
2011	19																	
2012	51																	
2013	89																	
2014	66																	
2015	31																	
2016	74																	
2017	11																	
	<b>Item Type</b>	Multiple Choice (1 pt)																
	<b>Stimulus</b>																	
	<b>Data Analysis</b>																	
	<b>Item</b>	<b>State</b>																
(A) Weak negative correlation, because $r \approx -0.91$	A	20																
(B) Weak negative correlation, because $r \approx -0.09$	B*	40																
(C) Strong negative correlation, because $r \approx -0.91$	C	28																
(D) Strong negative correlation, because $r \approx -0.09$	D	12																
<b>Error Analysis</b>																		
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts																	
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early																	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>																		
*Correct Answer (B)																		

<b>A.4(B)</b> compare and contrast association and causation in real-world problems		<b>Analysis of Assessed Standards</b>	
2024 – Q20		<b>Cluster</b>	Linear Functions
Which situation best represents association but NOT causation?		<b>Subcluster</b>	Describing Linear Functions
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A*	58		
B			
C			
D			
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes Instructional Implications</b>			

\*Correct Answer (A)

<b>A.4(B)</b> compare and contrast association and causation in real-world problems		<b>Analysis of Assessed Standards</b>	
2022 – Q11		<b>Cluster</b>	Linear Functions
<b>11</b> Which situation shows causation?		<b>Subcluster</b>	Describing Linear Functions
<p><b>A</b> When the number of people in a bus increases, the number of animals in a zoo also increases.</p> <p><b>B</b> When the number of hours worked each week by an hourly employee decreases, the amount of money earned by the employee also decreases.</p> <p><b>C</b> When the amount of a discount for a sale increases, the number of items sold during the sale decreases.</p> <p><b>D</b> When the number of bike trails in a city decreases, the amount of rainfall in the city increases.</p>		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	5	
	B*	74	
	C	17	
	D	4	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.4(C)</b> write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems		<b>Analysis of Assessed Standards</b>	
2025 – Q25		<b>Cluster</b>	Linear Functions
A restaurant owner experimented with different prices for the lunch special. The table shows the linear relationship between the price of the lunch special in dollars and the number of lunch specials sold on six different days.		<b>Subcluster</b>	Writing Linear Equations
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Item Type</b>	Multiselect (2 pts)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
<input type="checkbox"/> Approximately 82 lunch specials would be sold if the price were \$5.00.	Full Credit	35	
<input type="checkbox"/> Approximately 111 lunch specials would be sold if the price were \$6.00.	No Credit	21	
<input type="checkbox"/> Approximately 102 lunch specials would be sold if the price were \$7.50.	Partial Credit	44	
<input type="checkbox"/> Approximately 74 lunch specials would be sold if the price were \$12.50.			
<input type="checkbox"/> Approximately 28 lunch specials would be sold if the price were \$15.00.			
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

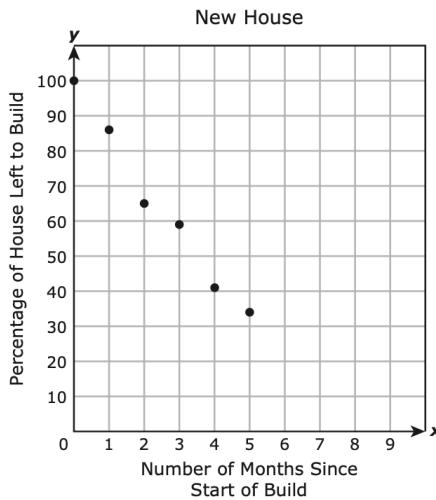
\*Correct Answer (B, E)

<b>A.4(C)</b> write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems	<b>Analysis of Assessed Standards</b>																	
2023 – Q26	<b>Cluster</b>	Linear Functions																
The table shows the number of customers each hour for an online sale.	<b>Subcluster</b>	Writing Linear Equations																
<b>Online Sale</b>	<b>Content</b>	Supporting																
<table border="1"> <thead> <tr> <th>Hours after the Sale Began, <math>x</math></th> <th>Number of Customers, <math>f(x)</math></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>296</td> </tr> <tr> <td>2</td> <td>256</td> </tr> <tr> <td>3</td> <td>215</td> </tr> <tr> <td>4</td> <td>170</td> </tr> <tr> <td>5</td> <td>133</td> </tr> <tr> <td>6</td> <td>89</td> </tr> <tr> <td>7</td> <td>51</td> </tr> </tbody> </table>	Hours after the Sale Began, $x$	Number of Customers, $f(x)$	1	296	2	256	3	215	4	170	5	133	6	89	7	51	<b>Process</b>	
Hours after the Sale Began, $x$	Number of Customers, $f(x)$																	
1	296																	
2	256																	
3	215																	
4	170																	
5	133																	
6	89																	
7	51																	
Which function best models the data in the table?	<b>Item Type</b>	Multiple Choice (1 pt)																
(A) $f(x) = 296 - 41x$	<b>Stimulus</b>																	
(B) $f(x) = 337 - 41x$	<b>Data Analysis</b>																	
(C) $f(x) = 317 - 38x$	<b>Item</b>	<b>State</b>																
(D) $f(x) = 296 - 38x$	A	18																
	B*	61																
	C	13																
	D	8																
	<b>Error Analysis</b>																	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts																
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early																
<b>*Correct Answer (B)</b>	<b>Learning from Mistakes</b> <b>Instructional Implications</b>																	

**A.4(C)** write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems

2022 – Q29

- 29** A construction manager is monitoring the progress of the build of a new house. The scatterplot and table show the number of months since the start of the build and the percentage of the house still left to build. A linear function can be used to model this relationship.



Number of Months Since Start of Build, $x$	Percentage of House Left to Build, $y$
0	100
1	86
2	65
3	59
4	41
5	34

Which function best models the data?

- A**  $y = -13.5x + 97.8$
- B**  $y = -13.5x + 7.3$
- C**  $y = 97.8x - 13.5$
- D**  $y = 7.3x - 97.8$

\*Correct Answer (A)

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Writing Linear Equations
<b>Content</b>	Supporting
<b>Process</b>	
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
<b>A*</b>	62	
<b>B</b>	17	
<b>C</b>	13	
<b>D</b>	8	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error       Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.5(A)** solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides

! 2025 – Q29

What value of  $z$  makes the equation  $\frac{4}{3}z + 6 = -4\left(\frac{1}{6}z + 9\right)$  true?

(A)  $\frac{3}{2}$

(B)  $-21$

(C)  $\frac{9}{2}$

(D)  $-45$

\*Correct Answer (B)

#### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Solving Linear Equations
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B*	58	
C		
D		

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<b>A.5(A)</b> solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	<b>Analysis of Assessed Standards</b>	
!	Cluster	Linear Functions
2025 – Q46	Subcluster	Solving Linear Equations
	Content	Readiness
	Process	
	Item Type	Multiple Choice (1 pt)
	Stimulus	
	<b>Data Analysis</b>	
	Item	State
	A*	42
	B	
	C	
	D	
	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	
*Correct Answer (A)		

**A.5(A)** solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides

2024 – Q24

What value of  $m$  makes the equation  $\frac{2}{3}(m - 9) = \frac{1}{3}(m - 27)$  true?

(A) -9

(B) -3

(C) -1

(D) -6

#### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Solving Linear Equations
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A*	61	
B		
C		
D		

#### Error Analysis

- Guessing     Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (A)

**A.5(A)** solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides

! 2024 – Q46

What is the solution to the equation  $7w - 2(w - 9) = 4 - 8(w + 2)$ ?

(A)  $w = -\frac{26}{9}$

(B)  $w = -\frac{10}{9}$

(C)  $w = \frac{15}{13}$

(D)  $w = -\frac{30}{13}$

#### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Solving Linear Equations
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C		
D*	41	

#### Error Analysis

- Guessing     Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (D)

<b>A.5(A)</b> solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	<b>Analysis of Assessed Standards</b>	
2023 – Q4	<b>Cluster</b>	Linear Functions
A rectangle has a length of $(5 + 2x)$ inches and a width of 10 inches. A triangle has a base of 30 inches and a height of $(4x - 10)$ inches. The area in square inches of the rectangle is equal to the area in square inches of the triangle.	<b>Subcluster</b>	Solving Linear Equations
What is the value of $x$ ?	<b>Content</b>	Readiness
<p><input type="radio"/> A 2.5</p> <p><input type="radio"/> B 3</p> <p><input type="radio"/> C 7.5</p> <p><input type="radio"/> D 5</p>	<b>Process</b>	
	<b>Item Type</b>	Multiple Choice (1 pt)
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	A	27
	B	21
	C	30
	D*	22
<b>*Correct Answer (D)</b>	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

<b>A.5(A)</b> solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	<b>Analysis of Assessed Standards</b>	
2023 – Q29	<b>Cluster</b>	Linear Functions
What is the solution to the equation $5(2w + 4) = 4(2w + 9)$ ?	<b>Subcluster</b>	Solving Linear Equations
<input type="radio"/> A $w = \frac{5}{2}$	<b>Content</b>	Readiness
<input type="radio"/> B $w = 8$	<b>Process</b>	
<input type="radio"/> C $w = \frac{28}{9}$	<b>Item Type</b>	Multiple Choice (1 pt)
<input type="radio"/> D $w = 5$	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	A	16
	B*	63
	C	14
	D	7
<b>*Correct Answer (B)</b>	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

<b>A.5(A)</b> solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	<b>Analysis of Assessed Standards</b>	
2022 – Q42	<b>Cluster</b>	Linear Functions
<b>42</b> What is the solution to $4(q + 56.5) = 30q - 112$ ?	<b>Subcluster</b>	Solving Linear Equations
Record your answer and fill in the bubbles on your answer document.	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	13	42*
		57
	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
<b>*Correct Answer (13)</b>	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

<b>A.5(A)</b> solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	<b>Analysis of Assessed Standards</b>	
2022 – Q51	<b>Cluster</b>	Linear Functions
<b>51</b> What is the solution to this equation?  $2(40 - 5y) = 10y + 5(1 - y)$ <p><b>A</b> 7.5  <b>B</b> 15  <b>C</b> 5  <b>D</b> Not here</p>	<b>Subcluster</b>	Solving Linear Equations
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	A	11
	B	15
	C*	52
	D	22
*Correct Answer (C)	<b>Error Analysis</b> <input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early	
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

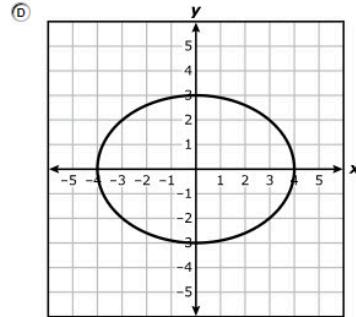
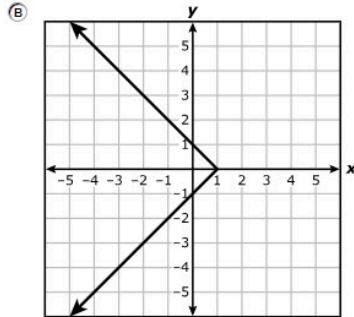
**A.12(A)** decide whether relations represented verbally, tabularly, graphically, and symbolically define a function

2024 – Q44

Which relation best represents  $y$  as a function of  $x$ ?

(A)	$x$	$y$
-2	-4	
1	-2	
-2	4	
2	0	

(C)	$x$	$y$
-4	-3	
-1	0	
2	-5	
6	7	



\*Correct Answer (C)

### Analysis of Assessed Standards

<b>Cluster</b>	Linear Functions
<b>Subcluster</b>	Describing Linear Functions
<b>Content</b>	Supporting
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
A		
B		
C*	62	
D		

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.12(B)</b> evaluate functions, expressed in function notation, given one or more elements in their domains		<b>Analysis of Assessed Standards</b>			
2023 – Q47		<b>Cluster</b>	Linear Functions		
		<b>Subcluster</b>	Describing Linear Functions		
		<b>Content</b>	Supporting		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
Item	State	Local			
A	13				
B*	63				
C	12				
D	11				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts				
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early				
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					
*Correct Answer (B)					

A.12(B) evaluate functions, expressed in function notation, given one or more elements in their domains		Analysis of Assessed Standards	
2022 – Q31		<b>Cluster</b>	Linear Functions
<b>31</b> A function is shown.		<b>Subcluster</b>	Describing Linear Functions
$f(x) = 7 - 4x$		<b>Content</b>	Supporting
What is the value of $f(-5)$ ?		<b>Process</b>	
<b>A</b> 27		<b>Stimulus</b>	
<b>B</b> -13		<b>Data Analysis</b>	
<b>C</b> -15		<b>Item</b>	<b>State</b>
<b>D</b> 140		<b>A*</b>	58
		<b>B</b>	20
		<b>C</b>	18
		<b>D</b>	4
<b>*Correct Answer (A)</b>		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

**A.12(C)** identify terms of arithmetic and geometric sequences when the sequences are given in function form using recursive processes

! 2023 – Q31

A sequence is defined by  $f(1) = 27$  and  $f(n) = \frac{1}{3}f(n - 1)$  for each whole number  $n$ , where  $n > 1$ . What are the first four terms of the sequence?

(A) 27, 9, 3, 1

(B) 27, 81, 243, 729

(C)  $\frac{1}{3}, \frac{28}{3}, \frac{55}{3}, \frac{82}{3}$

(D)  $\frac{1}{3}, \frac{1}{81}, \frac{1}{2,187}, \frac{1}{59,049}$

#### Analysis of Assessed Standards

Cluster	Linear Functions
Subcluster	Writing Linear Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A*	41	
B	30	
C	21	
D	7	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (A)

## IQ Analysis | Investigating the Question

## A.12(D)

## RC 1

**A.12(D)** write a formula for the  $n$ th term of arithmetic and geometric sequences, given the value of several of their terms

! 2024 – Q8

The first five terms of a sequence are  $a_1 = 47$ ,  $a_2 = 33$ ,  $a_3 = 19$ ,  $a_4 = 5$ , and  $a_5 = -9$ .

Based on this information, create an equation that can be used to find the  $n$ th term of the sequence,  $a_n$ .

Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.

-61    -47    -14    14    47    61

$$a_n = \boxed{\phantom{00}} n + \boxed{\phantom{00}}$$

**Analysis of Assessed Standards**

Cluster	Linear Functions
Subcluster	Writing Linear Functions
Content	Supporting
Process	
Item Type	Drag and Drop (2 pts)
Stimulus	

**Data Analysis**

Item	State	Local
Full Credit	13	
No Credit	64	
Partial Credit	23	

**Error Analysis**

- Guessing     Mixed Up Concepts  
 Careless Error     Stopped Too Early

**Learning from Mistakes**  
**Instructional Implications**

\*Correct Answer (-14; 61)

A.12(E) solve mathematic and scientific formulas, and other literal equations, for a specified variable		Analysis of Assessed Standards	
2025 – Q31		Cluster	Linear Functions
Which equation is equivalent to $5x - 8y = 40$ when solved for $y$ ?		Subcluster	Solving Linear Equations
		Content	Supporting
		Process	
		Item Type	Multiple Choice (1 pt)
		Stimulus	
Data Analysis			
Item	State	Local	
A			
B			
C			
D*	47		
Error Analysis			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
Learning from Mistakes Instructional Implications			

\*Correct Answer (D)

<b>A.12(E)</b> solve mathematic and scientific formulas, and other literal equations, for a specified variable		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2023 – Q45	<b>Cluster</b>	Linear Functions
	Which equation is equivalent to $S = Ph + 2B$ when solved for $B$ ?	<b>Subcluster</b>	Solving Linear Equations
	<input type="radio"/> A $B = \frac{S - Ph}{2}$	<b>Content</b>	Supporting
	<input type="radio"/> B $B = \frac{2S}{Ph}$	<b>Process</b>	
	<input type="radio"/> C $B = \frac{SPh}{2}$	<b>Item Type</b>	Multiple Choice (1 pt)
	<input type="radio"/> D $B = \frac{S - 2}{Ph}$	<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A*	46	
	B	17	
	C	24	
	D	12	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (A)

# Systems of Equations and Inequalities

**A.2 Linear functions, equations, and inequalities.** The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations.

**A.3 Linear functions, equations, and inequalities.** The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations.

**A.5 Linear functions, equations, and inequalities.** The student applies the mathematical process standards to solve, with and without technology, linear equations and evaluate the reasonableness of their solutions.

<b>A.2(H)</b> write linear inequalities in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>	
2025 – Q14		<b>Cluster</b>	Systems of Equations and Inequalities
A baker wants to order apples and blueberries to make pies. Apples cost \$2.50 per pound, and blueberries cost \$3.00 per pound. The baker does not want to spend more than \$75.00.		<b>Subcluster</b>	Inequalities
Which inequality represents all possible combinations of $x$ , the number of pounds of apples, and $y$ , the number of pounds of blueberries, that the baker can order?		<b>Content</b>	Supporting
<p>(A) <math>5.5x + 5.5y \geq 75</math></p> <p>(B) <math>2.5x + 3y \leq 75</math></p> <p>(C) <math>3x + 2.5y \leq 75</math></p> <p>(D) <math>2.5x + 3y \geq 75</math></p>		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A			
B*	59		
C			
D			
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.2(H)</b> write linear inequalities in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>																			
2023 – Q12		<b>Cluster</b>	Systems of Equations and Inequalities																		
A customer is ordering hats and T-shirts from an online store. Each hat costs \$7, and each T-shirt costs \$10. The customer receives free shipping if the amount of the order is over \$100.		<b>Subcluster</b>	Inequalities																		
Write an inequality that represents all possible combinations of hats, $x$ , and T-shirts, $y$ , in an order that qualifies for free shipping.		<b>Content</b>	Supporting																		
Move the correct answer to each box. Not all answers will be used.		<b>Process</b>																			
<input type="text" value="100"/> <input type="text" value="7"/> <input type="text" value="10"/> <input type="text" value="17"/> < <input type="text" value="&gt;"/> =		<b>Item Type</b>	Drag and Drop (2 pts)																		
<input type="text"/> $x$ + <input type="text"/> $y$ <input type="text"/> <input type="text"/>		<b>Stimulus</b>																			
<b>Data Analysis</b>																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Item</th><th style="text-align: center;">State</th><th style="text-align: center;">Local</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">Full Credit</td><td style="text-align: center;">38</td><td></td></tr> <tr> <td style="text-align: center;">No Credit</td><td style="text-align: center;">16</td><td></td></tr> <tr> <td style="text-align: center;">Partial Credit</td><td style="text-align: center;">46</td><td></td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table>				Item	State	Local	Full Credit	38		No Credit	16		Partial Credit	46							
Item	State	Local																			
Full Credit	38																				
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<b>Error Analysis</b>																					
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early																					
<b>Learning from Mistakes</b> <b>Instructional Implications</b>																					

\*Correct Answer (7, 10, >, 100)

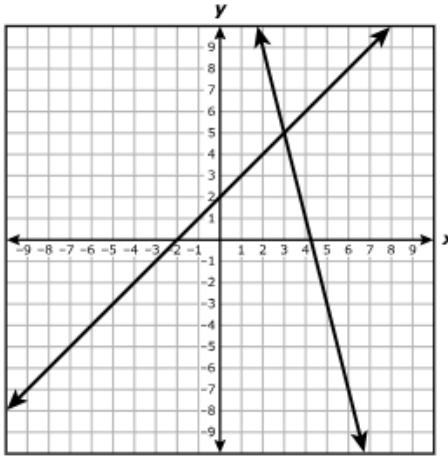
<b>A.2(H)</b> write linear inequalities in two variables given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>																			
2022 – Q28		<b>Cluster</b>	Systems of Equations and Inequalities																		
<b>28</b> A university will spend at most \$4,500 to buy monitors and keyboards for a computer lab. Each monitor will cost \$250, and each keyboard will cost \$50.		<b>Subcluster</b>	Inequalities																		
Which inequality represents all possible combinations of $x$ , the number of monitors, and $y$ , the number of keyboards, the university can buy for the computer lab?		<b>Content</b>	Supporting																		
<b>F</b> $250x + 50y < 4,500$		<b>Process</b>																			
<b>G</b> $250x + 50y \leq 4,500$		<b>Stimulus</b>																			
<b>H</b> $50x + 250y < 4,500$		<b>Data Analysis</b>																			
<b>J</b> $50x + 250y \leq 4,500$		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Item</th><th style="text-align: center;">State</th><th style="text-align: center;">Local</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">F</td><td style="text-align: center;">15</td><td></td></tr> <tr> <td style="text-align: center;">G*</td><td style="text-align: center;">71</td><td></td></tr> <tr> <td style="text-align: center;">H</td><td style="text-align: center;">8</td><td></td></tr> <tr> <td style="text-align: center;">J</td><td style="text-align: center;">6</td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table>		Item	State	Local	F	15		G*	71		H	8		J	6				
Item	State	Local																			
F	15																				
G*	71																				
H	8																				
J	6																				
<b>Error Analysis</b>																					
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early																					
<b>Learning from Mistakes</b> <b>Instructional Implications</b>																					

\*Correct Answer (G)

**A.2(I)** write systems of two linear equations given a table of values, a graph, and a verbal description

2025 – Q4

A system of linear equations is shown on a coordinate plane.



Which system of equations best represents the system shown on the graph?

(A)  $y = x + 2$

$$y = -4x + 17$$

(B)  $y = x + 2$

$$y = -4x + 15$$

(C)  $x + y = 2$

$$4x + y = 17$$

(D)  $x + y = 2$

$$4x + y = 15$$

\*Correct Answer (A)

#### Analysis of Assessed Standards

Cluster	Systems of Equations and Inequalities
Subcluster	Systems of Equations
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A*	66	
B		
C		
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<b>A.2(I) write systems of two linear equations given a table of values, a graph, and a verbal description</b>		<b>Analysis of Assessed Standards</b>	
<b>!</b> 2025 – Q34		<b>Cluster</b>	Systems of Equations and Inequalities
The perimeter of a rectangular garden is 48 meters. The length of the garden, $y$ , is 6 meters more than twice the width, $x$ .		<b>Subcluster</b>	Systems of Equations
Which system of equations can be used to find the length and width of the garden in meters?		<b>Content</b>	Readiness
<p>(A) <math>2x + 2y = 48</math>  <math>y = 6x + 2</math></p> <p>(B) <math>x + y = 48</math>  <math>y = 2x + 6</math></p> <p>(C) <math>2x + 2y = 48</math>  <math>y = 2x + 6</math></p> <p>(D) <math>x + y = 48</math>  <math>y = 6x + 2</math></p>		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		A	
		B	
		C*	34
		D	
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	
*Correct Answer (C)			

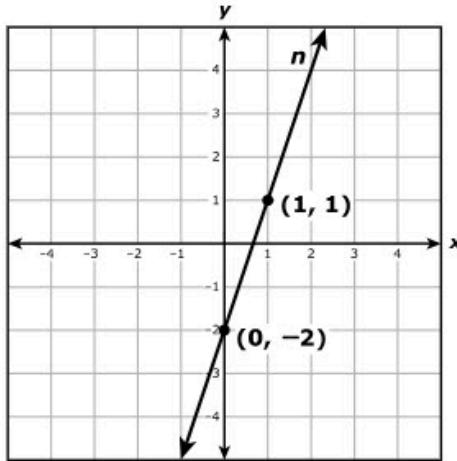
<b>A.2(I)</b> write systems of two linear equations given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>	
2024 – Q26		<b>Cluster</b>	Systems of Equations and Inequalities
Hot dogs and bags of popcorn were sold at a concession stand. One family paid \$8.00 for 2 hot dogs and 3 bags of popcorn. Another family paid \$16.50 for 5 hot dogs and 4 bags of popcorn.		<b>Subcluster</b>	Systems of Equations
Which system of equations can be used to determine the price in dollars of a hot dog, $x$ , and the price in dollars of a bag of popcorn, $y$ ?		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A		
	B*	73	
	C		
	D		
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (B)

**A.2(I)** write systems of two linear equations given a table of values, a graph, and a verbal description

! 2024 – Q39

Line  $n$  is shown on the coordinate grid. The table of ordered pairs represents some points on line  $p$ .

**Line  $p$** 

$x$	$y$
-1	6
0	4
1	2
2	0

Which system of equations represents line  $n$  and line  $p$ ?

(A)  $3x - y = 2$   
 $2x + y = 4$

(B)  $3x + y = -2$   
 $2x + y = 4$

(C)  $3x - y = 2$   
 $x + 2y = 4$

(D)  $3x + y = -2$   
 $x + 2y = 4$

\*Correct Answer (A)

**Analysis of Assessed Standards**

<b>Cluster</b>	Systems of Equations and Inequalities
<b>Subcluster</b>	Systems of Equations
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

**Data Analysis**

Item	State	Local
A*	32	
B		
C		
D		

**Error Analysis**

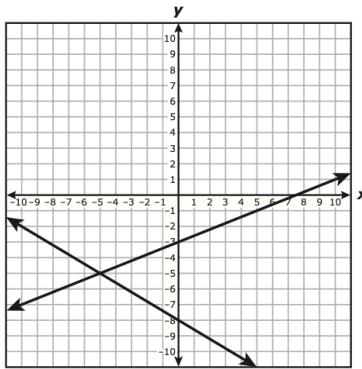
- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

**Learning from Mistakes  
Instructional Implications**

<b>A.2(I)</b> write systems of two linear equations given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>											
<b>!</b>	2023 – Q37	<b>Cluster</b>	Systems of Equations and Inequalities										
	The tables of ordered pairs represent some points on the graphs of two different lines.	<b>Subcluster</b>	Systems of Equations										
	<b>Line a</b>	<b>Content</b>	Readiness										
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td><b>x</b></td><td>- 11</td><td>- 6</td><td>- 1</td><td>4</td></tr> <tr><td><b>y</b></td><td>81</td><td>51</td><td>21</td><td>- 9</td></tr> </table>	<b>x</b>	- 11	- 6	- 1	4	<b>y</b>	81	51	21	- 9	<b>Process</b>	
<b>x</b>	- 11	- 6	- 1	4									
<b>y</b>	81	51	21	- 9									
	<b>Line b</b>	<b>Item Type</b>	Multiple Choice (1 pt)										
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td><b>x</b></td><td>- 9</td><td>- 4</td><td>1</td><td>6</td></tr> <tr><td><b>y</b></td><td>18</td><td>3</td><td>- 12</td><td>- 27</td></tr> </table>	<b>x</b>	- 9	- 4	1	6	<b>y</b>	18	3	- 12	- 27	<b>Stimulus</b>	
<b>x</b>	- 9	- 4	1	6									
<b>y</b>	18	3	- 12	- 27									
<b>Data Analysis</b>													
	<b>Item</b>	<b>State</b>	<b>Local</b>										
	A	16											
	B	21											
	C	24											
	D*	39											
<b>Error Analysis</b>													
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts											
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early											
<b>Learning from Mistakes</b> <b>Instructional Implications</b>													

\*Correct Answer (D)

<b>A.2(I)</b> write systems of two linear equations given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>	
2022 – Q3		<b>Cluster</b>	Systems of Equations and Inequalities
<b>3</b> A system of equations is graphed on the grid.		<b>Subcluster</b>	Systems of Equations
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	8	
	B*	76	
	C	9	
	D	6	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			



Which system of equations is best represented by the graph?

**A**  $y = \frac{2}{5}x - 8$   
 $y = -\frac{3}{5}x - 3$

**B**  $y = \frac{2}{5}x - 3$   
 $y = -\frac{3}{5}x - 8$

**C**  $y = \frac{5}{2}x - 8$   
 $y = -\frac{5}{3}x - 3$

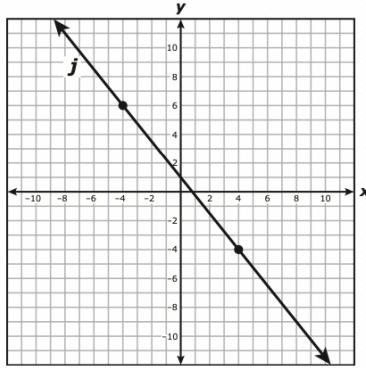
**D**  $y = \frac{5}{2}x - 3$   
 $y = -\frac{5}{3}x - 8$

\*Correct Answer (B)

<b>A.2(I)</b> write systems of two linear equations given a table of values, a graph, and a verbal description		<b>Analysis of Assessed Standards</b>	
2022 – Q12		<b>Cluster</b>	Systems of Equations and Inequalities
<b>12</b> A system of linear equations is represented by line $h$ and line $j$ . A table representing some points on line $h$ and the graph of line $j$ are shown.		<b>Subcluster</b>	Systems of Equations
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		F	8
		G	12
		H	21
		J*	59
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

Line  $h$ 

x	-16	-8	-4	12
y	7	1	-2	-14



Which system of equations is best represented by lines  $h$  and  $j$ ?

**F**  $y = \frac{4}{3}x - 5$

$y = \frac{4}{5}x + 1$

**G**  $y = \frac{3}{4}x - 5$

$y = \frac{5}{4}x + 1$

**H**  $y = -\frac{4}{3}x - 5$

$y = -\frac{4}{5}x + 1$

**J**  $y = -\frac{3}{4}x - 5$

$y = -\frac{5}{4}x + 1$

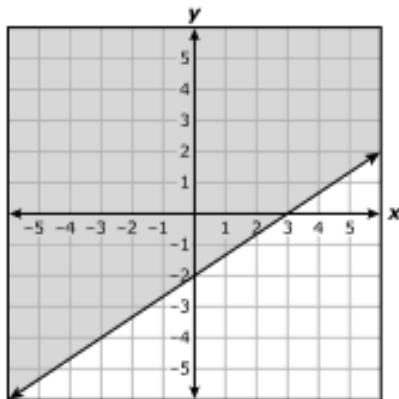
\*Correct Answer (J)



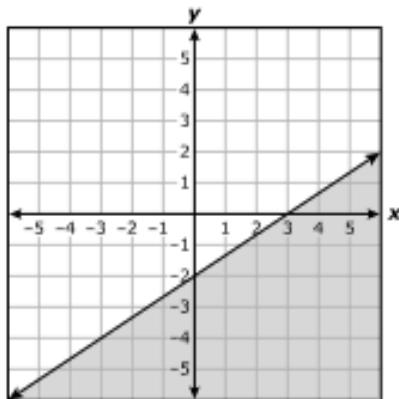
A.3(D) graph the solution set of linear inequalities in two variables on the coordinate plane	Analysis of Assessed Standards	
2025 – Q10	Cluster	Systems of Equations and Inequalities
	Subcluster	Inequalities

Which graph best represents the solution set of  $3y - 2x \leq -6$ ?

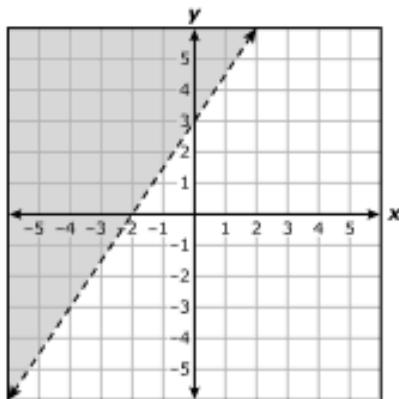
(A)



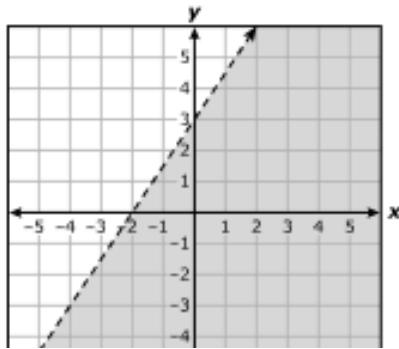
(B)



(C)



(D)



<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

**Data Analysis**

Item	State	Local
A		
B*	49	
C		
D		

**Error Analysis**

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

**Learning from Mistakes  
Instructional Implications**



\* Correct Answer (B)

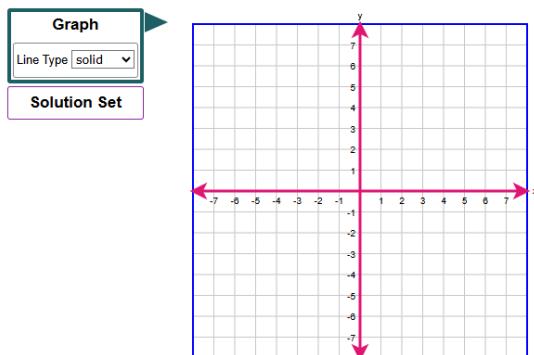
**A.3(D)** graph the solution set of linear inequalities in two variables on the coordinate plane

! 2025 – Q30

What is the solution set for the inequality  $y > 5x - 3$ ?

Graph the solution set of the linear inequality in the coordinate plane.

- First, select the Graph button to graph the line and choose the line style. To graph a line, select two points in the coordinate plane. A line will connect the points.
- Then select the Solution Set button to select the desired region.



**Analysis of Assessed Standards**

<b>Cluster</b>	Systems of Equations and Inequalities
<b>Subcluster</b>	Inequalities
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Graphing (2 pts)
<b>Stimulus</b>	

**Data Analysis**

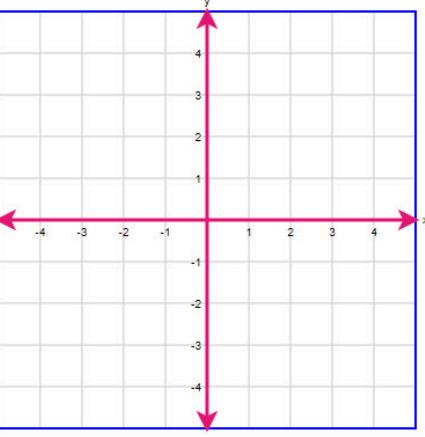
Item	State	Local
Full Credit	24	
No Credit	68	
Partial Credit	8	

**Error Analysis**

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

**Learning from Mistakes**  
**Instructional Implications**

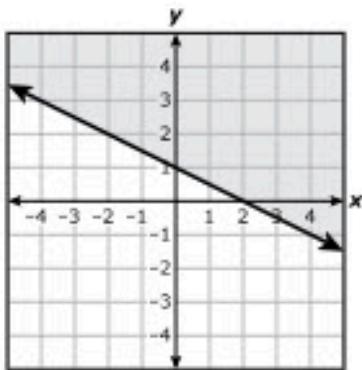
\* Correct Answer (Dashed line going through (0, -3) and (1, 2); shading the area that includes the point (0, 0))

<p><b>A.3(D)</b> graph the solution set of linear inequalities in two variables on the coordinate plane</p> <p>2024 – Q12</p> <p>What is the solution set that best represents the inequality <math>y \geq \frac{1}{2}x - 2</math>?</p> <p>Graph the solution set of the linear inequality in the coordinate plane.</p> <ul style="list-style-type: none"> <li>First, select the Graph button to graph the line and choose the line style. To graph a line, select two points in the coordinate plane. A line will connect the points.</li> <li>Then select the Solution Set button to select the desired region.</li> </ul>  <p>*Correct Answer (Solid line going through (0, -2) and (2, -1); shading the area that includes the point (0, 0))</p>	<table border="1"> <thead> <tr> <th colspan="2"><b>Analysis of Assessed Standards</b></th></tr> </thead> <tbody> <tr> <td><b>Cluster</b></td><td>Systems of Equations and Inequalities</td></tr> <tr> <td><b>Subcluster</b></td><td>Inequalities</td></tr> <tr> <td><b>Content</b></td><td>Readiness</td></tr> <tr> <td><b>Process</b></td><td></td></tr> <tr> <td><b>Item Type</b></td><td>Graphing (2 pts)</td></tr> <tr> <td><b>Stimulus</b></td><td></td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="3"><b>Data Analysis</b></th></tr> <tr> <th><b>Item</b></th><th><b>State</b></th><th><b>Local</b></th></tr> </thead> <tbody> <tr> <td>Full Credit</td><td>34</td><td></td></tr> <tr> <td>No Credit</td><td>51</td><td></td></tr> <tr> <td>Partial Credit</td><td>15</td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2"><b>Error Analysis</b></th></tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Guessing</td><td><input type="checkbox"/> Mixed Up Concepts</td></tr> <tr> <td><input type="checkbox"/> Careless Error</td><td><input type="checkbox"/> Stopped Too Early</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2"><b>Learning from Mistakes</b> <b>Instructional Implications</b></th></tr> </thead> <tbody> <tr> <td></td><td></td></tr> </tbody> </table>	<b>Analysis of Assessed Standards</b>		<b>Cluster</b>	Systems of Equations and Inequalities	<b>Subcluster</b>	Inequalities	<b>Content</b>	Readiness	<b>Process</b>		<b>Item Type</b>	Graphing (2 pts)	<b>Stimulus</b>		<b>Data Analysis</b>			<b>Item</b>	<b>State</b>	<b>Local</b>	Full Credit	34		No Credit	51		Partial Credit	15					<b>Error Analysis</b>		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	<b>Learning from Mistakes</b> <b>Instructional Implications</b>			
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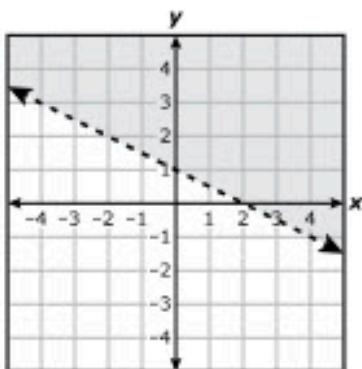
A.3(D) graph the solution set of linear inequalities in two variables on the coordinate plane	Analysis of Assessed Standards	
2024 – Q41	Cluster	Systems of Equations and Inequalities
	Subcluster	Inequalities

Which graph best represents the solution set of  $x + 2y \geq 2$ ?

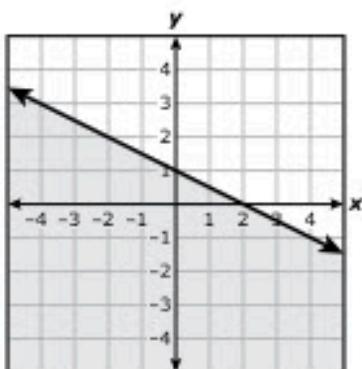
(A)



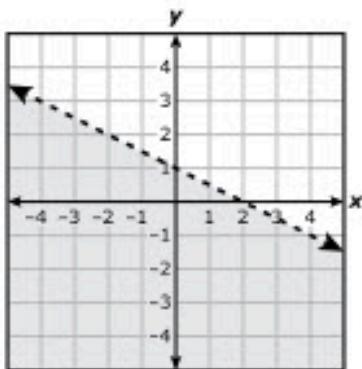
(B)



(C)

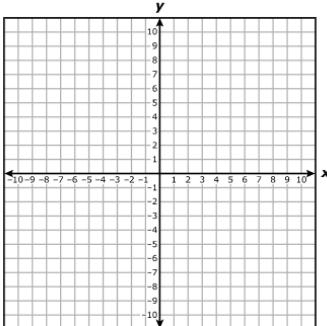


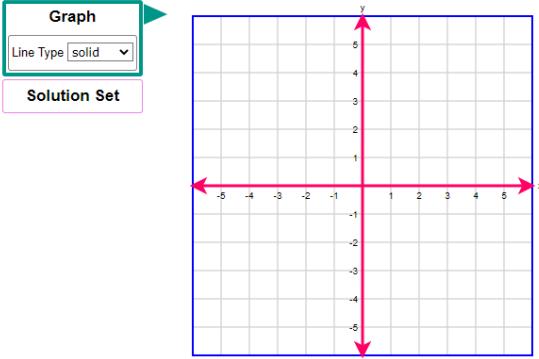
(D)



<b>Content</b>	Readiness	
<b>Process</b>		
<b>Item Type</b>	Multiple Choice (1 pt)	
<b>Stimulus</b>		
<b>Data Analysis</b>		
<b>Item</b>	<b>State</b>	<b>Local</b>
A*	58	
B		
C		
D		
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b>		
<b>Instructional Implications</b>		

\*Correct Answer (A)

A.3(D) graph the solution set of linear inequalities in two variables on the coordinate plane		Analysis of Assessed Standards		
2023 – Q17	Which ordered pair is in the solution set of $y \leq \frac{3}{5}x - 6$ ?	Cluster	Systems of Equations and Inequalities	
		Subcluster	Inequalities	
		Content	Readiness	
		Process		
		Item Type	Multiple Choice (1 pt)	
		Stimulus		
Data Analysis				
	Item	State	Local	
	A*	54		
	B	20		
	C	14		
	D	12		
Error Analysis				
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
Learning from Mistakes Instructional Implications				
*Correct Answer (A)				

<b>A.3(D)</b> graph the solution set of linear inequalities in two variables on the coordinate plane		<b>Analysis of Assessed Standards</b>	
2023 – Q43		<b>Cluster</b>	Systems of Equations and Inequalities
What is the solution set for the linear inequality $y \geq -x + 2$ ?		<b>Subcluster</b>	Inequalities
Graph the solution set of the linear inequality in the coordinate plane.		<b>Content</b>	Readiness
<ul style="list-style-type: none"> <li>First, select the Graph button to graph the line and choose the line style. To graph a line, select two points in the coordinate plane. A line will automatically connect the points.</li> <li>Then, select the Solution Set button and select the desired region to be shaded.</li> </ul>		<b>Process</b>	
 <p>The graphing interface includes a 'Graph' button with a dropdown menu showing 'Line Type: solid'. Below it is a 'Solution Set' button. The coordinate plane shows a red line with arrows at both ends, passing through the points (0, 2) and (1, 1). The region above and to the left of the line is shaded in light blue.</p>		<b>Item Type</b>	Graphing (2 pts)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	Full Credit	30	
	No Credit	57	
	Partial Credit	12	
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

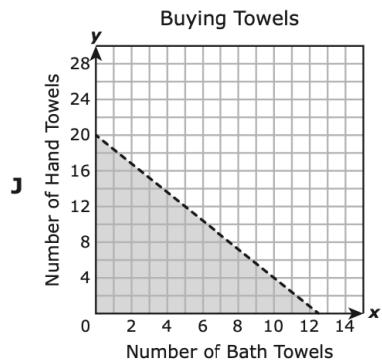
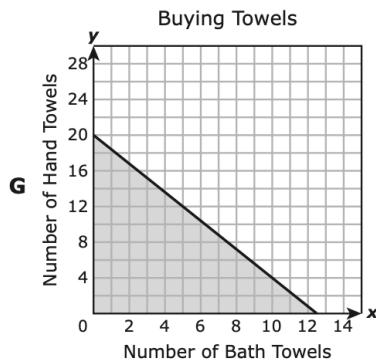
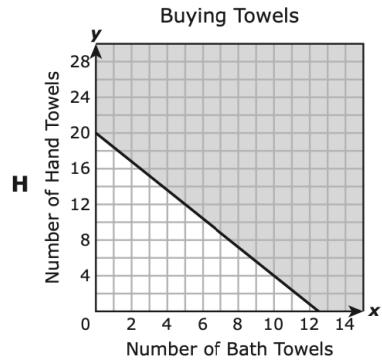
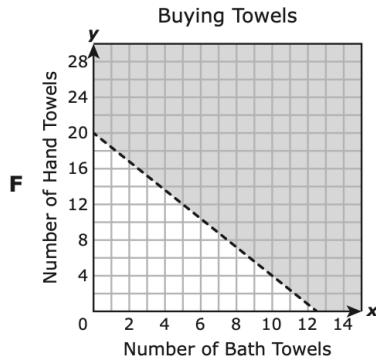
\*Correct Answer (Solid line going through (0, 2) and (1, 1); shading is the area that does not include the point (0, 0))

**A.3(D)** graph the solution set of linear inequalities in two variables on the coordinate plane

2022 – Q8

- 8** A customer is buying bath towels and hand towels and can spend no more than \$100. Each bath towel costs \$8, and each hand towel costs \$5. The inequality  $8x + 5y \leq 100$  represents all possible combinations of  $x$ , the number of bath towels, and  $y$ , the number of hand towels the customer can buy.

Which graph best represents the solution set for this inequality?



\*Correct Answer (G)

**Analysis of Assessed Standards**

<b>Cluster</b>	Systems of Equations and Inequalities
<b>Subcluster</b>	Inequalities
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

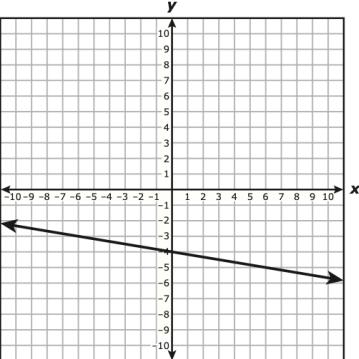
**Data Analysis**

Item	State	Local
F	12	
G*	53	
H	22	
J	14	

**Error Analysis**

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

**Learning from Mistakes**  
**Instructional Implications**

<b>A.3(D)</b> graph the solution set of linear inequalities in two variables on the coordinate plane		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2022 – Q37	<b>Cluster</b>	Systems of Equations and Inequalities
<b>37</b>	The graph of $y = -\frac{1}{6}x - 4$ is shown on the grid.	<b>Subcluster</b>	Inequalities
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A*	29	
	B	43	
	C	22	
	D	6	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

Which ordered pair is in the solution set of  $y > -\frac{1}{6}x - 4$ ?

- A**  $(-8, 8)$
- B**  $(6, -5)$
- C**  $(4, -6)$
- D**  $(-2, -7)$

\* Correct Answer (A)

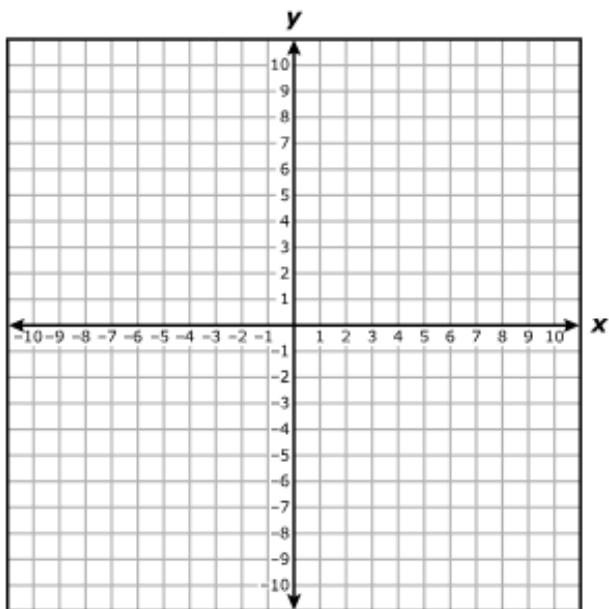
**A.3(F)** graph systems of two linear equations in two variables on the coordinate plane and determine the solutions if they exist

2025 – Q45

A system of equations is shown.

$$x + y = -8$$

$$2x + 2y = 10$$



Which statement is true about this system of equations?

- (A) There are infinitely many solutions.
- (B) The only solution is  $(-8, 5)$ .
- (C) The only solution is  $(5, -8)$ .
- (D) There is no solution.

\*Correct Answer (D)

#### Analysis of Assessed Standards

Cluster	Systems of Equations and Inequalities
Subcluster	Systems of Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C		
D*	46	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error       Stopped Too Early

#### Learning from Mistakes Instructional Implications

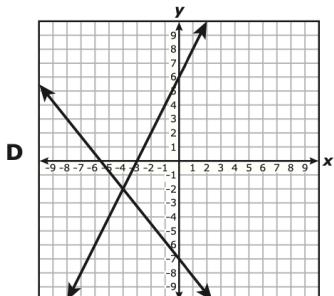
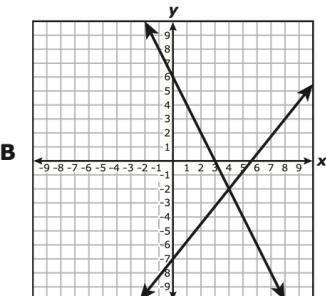
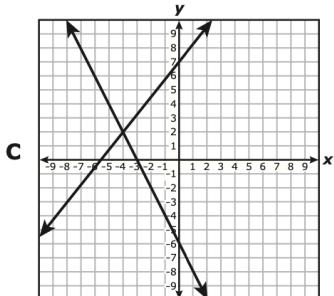
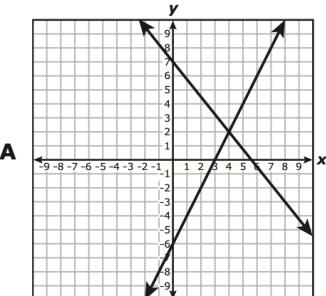
<p><b>A.3(F)</b> graph systems of two linear equations in two variables on the coordinate plane and determine the solutions if they exist</p> <p>2024 – Q45</p> <p>The function <math>f(x) = -4x + 8</math> represents the first of two equations in a system of linear equations. The second equation in the system has a different slope than the first equation.</p> <p>Which statement is true about the solution to the system of equations?</p> <ul style="list-style-type: none"> <li>(A) The system has no solutions.</li> <li>(B) The system has exactly one solution.</li> <li>(C) The system has exactly two solutions.</li> <li>(D) The system has infinitely many solutions.</li> </ul> <p>*Correct Answer (B)</p>	<b>Analysis of Assessed Standards</b>	
<b>Cluster</b>	Systems of Equations and Inequalities	
<b>Subcluster</b>	Systems of Equations	
<b>Content</b>	Supporting	
<b>Process</b>		
<b>Item Type</b>	Multiple Choice (1 pt)	
<b>Stimulus</b>		
<b>Data Analysis</b>		
<b>Item</b>	<b>State</b>	<b>Local</b>
A		
B*	50	
C		
D		
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

**A.3(F)** graph systems of two linear equations in two variables on the coordinate plane and determine the solutions if they exist

! 2022 – Q45

45 Which graph best represents this system of equations and its solution?

$$\begin{aligned}2x &= 6 - y \\5x - 4y &= 28\end{aligned}$$



\*Correct Answer (B)

### Analysis of Assessed Standards

<b>Cluster</b>	Systems of Equations and Inequalities
<b>Subcluster</b>	Systems of Equations
<b>Content</b>	Supporting
<b>Process</b>	
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
A	20	
B*	47	
C	18	
D	15	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.3(G)</b> estimate graphically the solutions to systems of two linear equations with two variables in real-world problems		<b>Analysis of Assessed Standards</b>		
2024 – Q15		<b>Cluster</b>	Systems of Equations and Inequalities	
Two hikers begin hiking at the same time from different locations on a trail. The system of equations graphed on the grid represents this situation.		<b>Subcluster</b>	Systems of Equations	
		<b>Content</b>	Supporting	
		<b>Process</b>		
		<b>Item Type</b>	Multiple Choice (1 pt)	
		<b>Stimulus</b>		
		<b>Data Analysis</b>		
		<b>Item</b>	<b>State</b>	<b>Local</b>
	(A)			
	(B)*	61		
	(C)			
	(D)			
<b>Error Analysis</b>				
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early				
<b>Learning from Mistakes</b> <b>Instructional Implications</b>				
*Correct Answer (B)				

<b>A.3(G)</b> estimate graphically the solutions to systems of two linear equations with two variables in real-world problems		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2023 – Q30	<b>Cluster</b>	Systems of Equations and Inequalities
	The two types of tickets sold at a baseball game are standard tickets and discounted tickets. The price of a discounted ticket was 80% of the price of a standard ticket.	<b>Subcluster</b>	Systems of Equations
	<ul style="list-style-type: none"> <li>There were 153 standard tickets sold at the baseball game.</li> <li>There were 47 discounted tickets sold at the baseball game.</li> <li>The total amount of ticket sales from the standard and discounted tickets was \$2,649.34.</li> </ul>	<b>Content</b>	Supporting
	The line graphed on the grid represents the first equation in a system of linear equations for this situation.	<b>Process</b>	
	<p style="text-align: center;"><b>Baseball Game</b></p>	<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	21	
	B	24	
	C	34	
	D*	21	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes Instructional Implications</b>			

If the second equation in the system is  $y = 0.80x$ , what is the best estimate of the price of a discounted ticket?

- ⓐ \$13.95  
 ⓑ \$14.55  
 ⓒ \$13.25  
 ⓔ \$11.15

\*Correct Answer (D)

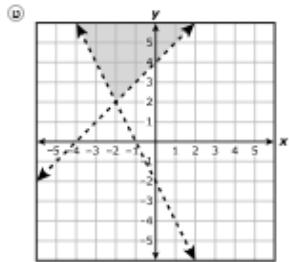
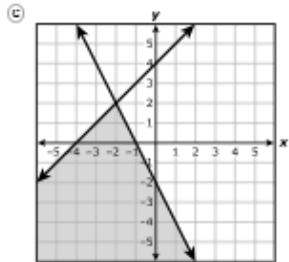
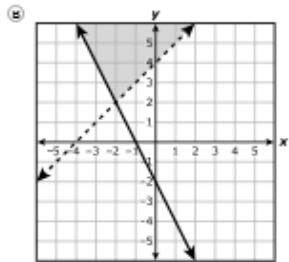
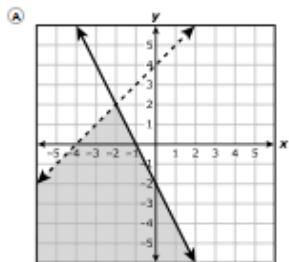
**A.3(H)** graph the solution set of systems of two linear inequalities in two variables on the coordinate plane

2025 – Q38

Which graph best represents the solution set for the system of inequalities?

$$y < x + 4$$

$$y \leq -2x - 2$$



\*Correct Answer (A)

### Analysis of Assessed Standards

Cluster	Systems of Equations and Inequalities
Subcluster	Inequalities
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

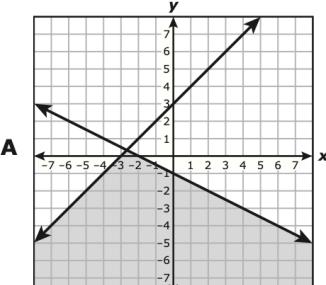
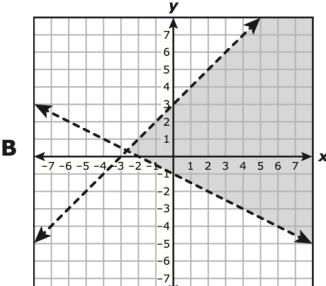
### Data Analysis

Item	State	Local
A*	63	
B		
C		
D		

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error       Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.3(H)</b> graph the solution set of systems of two linear inequalities in two variables on the coordinate plane	<b>Analysis of Assessed Standards</b>	
2022 – Q39 <b>39</b> Which graph best represents the solution set for this system of inequalities? $x + 2y < -2$ $y - x < 3$	<b>Cluster</b> Systems of Equations and Inequalities <b>Subcluster</b> Inequalities <b>Content</b> Supporting <b>Process</b> <b>Stimulus</b>	
 <b>A</b>	<b>Data Analysis</b>	
 <b>B</b>	<b>Item</b> State Local A 15 B 22 C* 50 D 12 <b>Error Analysis</b> <input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early <b>Learning from Mistakes</b> <b>Instructional Implications</b>	
<b>*Correct Answer (C)</b>		

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>			
2025 – Q11		<b>Cluster</b>	Systems of Equations and Inequalities		
What is the value of $x$ in the solution to this system of equations?		<b>Subcluster</b>	Systems of Equations		
	$3x - 5y = 12$	<b>Content</b>	Readiness		
	$y = -6x + 2$	<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
(A) $\frac{22}{3}$	A				
(B) $-\frac{10}{3}$	B				
(C) $\frac{2}{3}$	C*	52			
(D) $-\frac{18}{3}$	D				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes Instructional Implications</b>					

\*Correct Answer (C)

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems	<b>Analysis of Assessed Standards</b>		
2025 – Q24	<b>Cluster</b>	Systems of Equations and Inequalities	
	<b>Subcluster</b>	Systems of Equations	
	<b>Content</b>	Readiness	
	<b>Process</b>		
	<b>Item Type</b>	Multiple Choice (1 pt)	
	<b>Stimulus</b>		
	<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A		
	B		
	C		
	D*	32	
	<b>Error Analysis</b>		
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>		
*Correct Answer (D)			

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
2024 – Q13		<b>Cluster</b>	Systems of Equations and Inequalities
Two customers purchased coffee and doughnuts at a coffee shop. Each cup of coffee costs the same amount, and each doughnut costs the same amount.		<b>Subcluster</b>	Systems of Equations
<ul style="list-style-type: none"> <li>The first customer paid \$4.90 for 1 cup of coffee and 2 doughnuts.</li> <li>The second customer paid \$8.60 for 2 cups of coffee and 3 doughnuts.</li> </ul> <p>What is the cost of 1 cup of coffee?</p>		<b>Content</b>	Readiness
<p>(A) \$2.50</p> <p>(B) \$1.20</p> <p>(C) \$4.90</p> <p>(D) \$3.70</p>		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A*	60		
B			
C			
D			
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b>			
<b>Instructional Implications</b>			

\*Correct Answer (A)

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2024 – Q42	<b>Cluster</b>	Systems of Equations and Inequalities
		<b>Subcluster</b>	Systems of Equations
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A			
B			
C			
D*	38		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (D)

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
2023 – Q23		<b>Cluster</b>	Systems of Equations and Inequalities
	What is the solution to this system of equations? $-3x + 5y = 21$ $6x - y = -15$	<b>Subcluster</b>	Systems of Equations
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A	12		
B*	68		
C	11		
D	9		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>															
<b>!</b>	2023 – Q40	<b>Cluster</b> Systems of Equations and Inequalities															
	A company advertises on two websites. Each website charges a different amount based on the number of clicks on the advertisement. The table shows the number of clicks on each website and the total cost for each of two days.	<b>Subcluster</b> Systems of Equations															
	<b>Cost of Website Advertisements</b>	<b>Content</b> Readiness															
	<table border="1"> <thead> <tr> <th>Day</th><th>Number of Clicks on Website 1</th><th>Number of Clicks on Website 2</th><th>Total Cost (dollars)</th></tr> </thead> <tbody> <tr> <td>Monday</td><td>15</td><td>29</td><td>94.15</td></tr> <tr> <td>Tuesday</td><td>25</td><td>29</td><td>121.15</td></tr> </tbody> </table>	Day	Number of Clicks on Website 1	Number of Clicks on Website 2	Total Cost (dollars)	Monday	15	29	94.15	Tuesday	25	29	121.15	<b>Process</b>			
Day	Number of Clicks on Website 1	Number of Clicks on Website 2	Total Cost (dollars)														
Monday	15	29	94.15														
Tuesday	25	29	121.15														
	What is the cost per click on Website 1?	<b>Item Type</b> Multiple Choice (1 pt)															
	<p><input type="radio"/> A \$1.85</p> <p><input type="radio"/> B \$5.38</p> <p><input type="radio"/> C \$2.20</p> <p><input checked="" type="radio"/> D \$2.70</p>	<b>Stimulus</b>															
<p>*Correct Answer (D)</p>		<b>Data Analysis</b>															
		<table border="1"> <thead> <tr> <th>Item</th><th>State</th><th>Local</th></tr> </thead> <tbody> <tr> <td>A</td><td>16</td><td></td></tr> <tr> <td>B</td><td>26</td><td></td></tr> <tr> <td>C</td><td>27</td><td></td></tr> <tr> <td>D*</td><td>31</td><td></td></tr> </tbody> </table>	Item	State	Local	A	16		B	26		C	27		D*	31	
Item	State	Local															
A	16																
B	26																
C	27																
D*	31																
		<b>Error Analysis</b>															
		<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early															
		<b>Learning from Mistakes</b>															
		<b>Instructional Implications</b>															

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>															
	2022 – Q5	<b>Cluster</b> Systems of Equations and Inequalities															
	<b>5</b> What is the solution to this system of equations?	<b>Subcluster</b> Systems of Equations															
	$\begin{aligned} 2x + y &= 40 \\ x - 2y &= -20 \end{aligned}$	<b>Content</b> Readiness															
	<p><input type="radio"/> A (12, 16)</p> <p><input type="radio"/> B (15, 17.5)</p> <p><input type="radio"/> C There is no solution.</p> <p><input type="radio"/> D There are an infinite number of solutions.</p>	<b>Process</b>															
		<b>Stimulus</b>															
		<b>Data Analysis</b>															
		<table border="1"> <thead> <tr> <th>Item</th><th>State</th><th>Local</th></tr> </thead> <tbody> <tr> <td>A*</td><td>56</td><td></td></tr> <tr> <td>B</td><td>9</td><td></td></tr> <tr> <td>C</td><td>22</td><td></td></tr> <tr> <td>D</td><td>13</td><td></td></tr> </tbody> </table>	Item	State	Local	A*	56		B	9		C	22		D	13	
Item	State	Local															
A*	56																
B	9																
C	22																
D	13																
		<b>Error Analysis</b>															
		<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early															
		<b>Learning from Mistakes</b>															
		<b>Instructional Implications</b>															

<b>A.5(C)</b> solve systems of two linear equations with two variables for mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2022 – Q49	<b>Cluster</b>	Systems of Equations and Inequalities
<b>49</b>	A mail carrier delivers mail on one of two different routes: a morning route or an afternoon route. Each workday the mail carrier is assigned one of these two routes.	<b>Subcluster</b>	Systems of Equations
	<ul style="list-style-type: none"> <li>Last month the mail carrier delivered mail on the morning route 16 times and on the afternoon route 12 times, for a total distance traveled of 141 miles.</li> <li>This month the mail carrier delivered mail on the morning route 10 times and on the afternoon route 15 times, for a total distance traveled of 123.75 miles.</li> </ul> <p>What is the distance of the morning route in miles?</p> <p><b>A</b> 5.25 mi  <b>B</b> 6.00 mi  <b>C</b> 4.75 mi  <b>D</b> 5.00 mi</p>	<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A*	39	
	B	21	
	C	27	
	D	13	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (A)

# Simplifying Expressions

**A.10 Number and algebraic methods.** The student applies the mathematical process standards and algebraic methods to rewrite in equivalent forms and perform operations on polynomial expressions.

**A.11 Number and algebraic methods.** The student applies the mathematical process standards and algebraic methods to rewrite algebraic expressions into equivalent forms.

A.10(A) add and subtract polynomials of degree one and degree two		Analysis of Assessed Standards	
<b>!</b> 2024 – Q35		Cluster	Simplifying Expressions
A triangle has sides whose lengths in units are represented by polynomials as shown, where $x$ is a positive integer.		Subcluster	Polynomials
		Content	Supporting
		Process	
		Item Type	Multiple Choice (1 pt)
		Stimulus	
Data Analysis			
Item	State	Local	
A			
B			
C*	47		
D			
Error Analysis			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
Learning from Mistakes Instructional Implications			

Which expression represents the perimeter of the triangle in units?

(A)  $\frac{15}{2}x$

(B)  $\frac{47}{6}x$

(C)  $\frac{13}{2}x + 1$

(D)  $\frac{13}{2}x + \frac{4}{3}$

\*Correct Answer (C)

<b>A.10(A)</b> add and subtract polynomials of degree one and degree two		<b>Analysis of Assessed Standards</b>	
2022 – Q23		<b>Cluster</b>	Simplifying Expressions
		<b>Subcluster</b>	Polynomials
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		Item	State
		A	8
		B*	63
		C	15
		D	14
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes Instructional Implications</b>	

\*Correct Answer (B)

<b>A.10(B) multiply polynomials of degree one and degree two</b>		<b>Analysis of Assessed Standards</b>		
2025 – Q23		<b>Cluster</b>	Simplifying Expressions	
		<b>Subcluster</b>	Polynomials	
		<b>Content</b>	Supporting	
		<b>Process</b>		
		<b>Item Type</b>	Multiple Choice (1 pt)	
		<b>Stimulus</b>		
<b>Data Analysis</b>				
Item	State	Local		
A				
B				
C*	50			
D				
<b>Error Analysis</b>				
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b>				
<b>Instructional Implications</b>				

\*Correct Answer (C)

<b>A.10(B)</b> multiply polynomials of degree one and degree two		<b>Analysis of Assessed Standards</b>	
2023 – Q33	Which expression is equivalent to $(2a + 5)(3a - 2)$ ?	<b>Cluster</b>	Simplifying Expressions
	<input type="radio"/> A $17a - 10$	<b>Subcluster</b>	Polynomials
	<input type="radio"/> B $6a^2 - 10$	<b>Content</b>	Supporting
	<input type="radio"/> C $6a^2 + 11a - 10$	<b>Process</b>	
	<input type="radio"/> D $6a^2 + 19a + 10$	<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		A	8
		B	24
		C*	61
		D	7
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	
*Correct Answer (C)			

<b>A.10(B)</b> multiply polynomials of degree one and degree two		<b>Analysis of Assessed Standards</b>	
2022 – Q10	10 Which expression is equivalent to $(n - 4)(2n + 7)$ ?	<b>Cluster</b>	Simplifying Expressions
	<input type="radio"/> F $3n + 3$	<b>Subcluster</b>	Polynomials
	<input type="radio"/> G $n - 28$	<b>Content</b>	Supporting
	<input type="radio"/> H $2n^2 - 15n - 28$	<b>Process</b>	
	<input type="radio"/> J $2n^2 - n - 28$	<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		F	12
		G	12
		H	14
		J*	62
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	
*Correct Answer (J)			

## IQ Analysis | Investigating the Question

A.10(C)

RC 1

**A.10(C)** determine the quotient of a polynomial of degree one and polynomial of degree two when divided by a polynomial of degree one and polynomial of degree two when the degree of the divisor does not exceed the degree of the dividend

! 2023 – Q16

What is the quotient represented by the expression  $\frac{8w^2 - 20w - 12}{2w + 1}$  for all values of  $w$  where the expression is defined?

(A)  $4w + 12$

(B)  $4w - 12$

(C)  $w - 3$

(D)  $w + 3$

## Analysis of Assessed Standards

Cluster	Simplifying Expressions
Subcluster	Polynomials
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

## Data Analysis

Item	State	Local
A	19	
B*	59	
C	11	
D	10	

## Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

Learning from Mistakes  
Instructional Implications

\*Correct Answer (B)

**A.10(D)** rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property

! 2025 – Q1

Which expression is equivalent to  $1.5(4j - 10k) - 2.5(8j + 6k)$ ?

(A)  $-12j + 4k$

(B)  $-26j$

(C)  $-14j - 30k$

(D)  $-14j$

\*Correct Answer (C)

#### Analysis of Assessed Standards

Cluster	Simplifying Expressions
Subcluster	Polynomials
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C*	61	
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<b>A.10(D)</b> rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2023 – Q39	<b>Cluster</b>	Simplifying Expressions
	Which expression is equivalent to $24gh - 12g^2 + 18g$ ?	<b>Subcluster</b>	Polynomials
	<input type="radio"/> A $6g(4h - 12g + 18)$	<b>Content</b>	Supporting
	<input type="radio"/> B $12g(2h - 12g + 18)$	<b>Process</b>	
	<input type="radio"/> C $6g(4h - 2g + 3)$	<b>Item Type</b>	Multiple Choice (1 pt)
	<input type="radio"/> D $12g(2h - g + 3)$	<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	12	
	B	24	
	C*	55	
	D	9	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (C)

<b>A.10(E)</b> factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$ , including perfect square trinomials of degree two		<b>Analysis of Assessed Standards</b>			
2025 – Q20		<b>Cluster</b>	Simplifying Expressions		
		<b>Subcluster</b>	Polynomials		
		<b>Content</b>	Readiness		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
	A				
	B				
	C				
	D*	41			
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					

\*Correct Answer (D)

**A.10(E)** factor, if possible, trinomials with real factors in the form  $ax^2 + bx + c$ , including perfect square trinomials of degree two

2025 – Q44

Which expressions are equivalent to  $6x^2 + 3x - 9$ ?

Select **TWO** correct answers.

$-3(2x^2 + x + 3)$

$3(2x^2 + x - 3)$

$3(2x - 3)(x + 1)$

$3(2x + 3)(x - 1)$

$-3(2x - 3)(x - 1)$

#### Analysis of Assessed Standards

<b>Cluster</b>	Simplifying Expressions
<b>Subcluster</b>	Polynomials
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiselect (2 pts)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
Full Credit	58	
No Credit	11	
Partial Credit	31	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (B, D)

**A.10(E)** factor, if possible, trinomials with real factors in the form  $ax^2 + bx + c$ , including perfect square trinomials of degree two

2024 – Q16

Which function is equivalent to  $f(x) = 6x^2 - 23x + 21$ ?

A  $f(x) = (3x - 7)(2x - 3)$

B  $f(x) = 3(x - 1)(2x - 7)$

C  $f(x) = (6x - 7)(x - 3)$

D  $f(x) = 3(x - 7)(2x - 1)$

\*Correct Answer (A)

#### Analysis of Assessed Standards

Cluster	Simplifying Expressions
Subcluster	Polynomials
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A*	68	
B		
C		
D		

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.10(E)** factor, if possible, trinomials with real factors in the form  $ax^2 + bx + c$ , including perfect square trinomials of degree two

2024 – Q37

Which expression is a factor of  $x^2 + 7x - 30$ ?

(A)  $x + 15$

(B)  $x - 10$

(C)  $x + 5$

(D)  $x - 3$

\*Correct Answer (D)

#### Analysis of Assessed Standards

Cluster	Simplifying Expressions
Subcluster	Polynomials
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C		
D*	40	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.10(E)** factor, if possible, trinomials with real factors in the form  $ax^2 + bx + c$ , including perfect square trinomials of degree two

### Analysis of Assessed Standards

2023 – Q5

Which expression is a factor of  $30x^2 - 4x - 16$ ?

(A)  $5x + 4$

(B)  $3x - 2$

(C)  $5x - 4$

(D)  $3x + 4$

**Cluster** Simplifying Expressions

**Subcluster** Polynomials

**Content** Readiness

**Process**

**Item Type** Multiple Choice (1 pt)

**Stimulus**

### Data Analysis

Item	State	Local
A	21	
B	17	
C*	52	
D	10	

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

\*Correct Answer (C)

**A.10(E)** factor, if possible, trinomials with real factors in the form  $ax^2 + bx + c$ , including perfect square trinomials of degree two

2023 – Q24

Which expressions are equivalent to  $12x^2 - 48x + 48$ ?

Select **TWO** correct answers.

$12(x - 2)^2$

$-12(x^2 + 4x + 4)$

$12(x - 4)(x - 1)$

$-12(x + 2)^2$

$12(x^2 - 4x + 4)$

#### Analysis of Assessed Standards

<b>Cluster</b>	Simplifying Expressions
<b>Subcluster</b>	Polynomials
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiselect (2 pts)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
Full Credit	50	
No Credit	13	
Partial Credit	36	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (A, E)

**A.10(E)** factor, if possible, trinomials with real factors in the form  $ax^2 + bx + c$ , including perfect square trinomials of degree two

2022 – Q14

**14** The expression  $d^2 - d - 6$  can be written in factored form as  $(d + 2)(d + k)$ , where  $k$  represents a number. What is the value of  $k$ ?

Record your answer and fill in the bubbles on your answer document.

#### Analysis of Assessed Standards

<b>Cluster</b>	Simplifying Expressions
<b>Subcluster</b>	Polynomials
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
-3	26*	
	73	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (-3)

<b>A.10(E)</b> factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$ , including perfect square trinomials of degree two		<b>Analysis of Assessed Standards</b>		
<b>!</b>	2022 – Q33	<b>Cluster</b>	Simplifying Expressions	
<b>33</b>	Which expression is a factor of $10x^2 - 19x + 6$ ?	<b>Subcluster</b>	Polynomials	
<b>A</b>	$10x - 3$	<b>Content</b>	Readiness	
<b>B</b>	$10x - 1$	<b>Process</b>		
<b>C</b>	$5x - 3$	<b>Stimulus</b>		
<b>D</b>	$5x - 2$	<b>Data Analysis</b>		
		<b>Item</b>	<b>State</b>	<b>Local</b>
		A	25	
		B	15	
		C	27	
		D*	34	
<b>Error Analysis</b>				
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts				
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early				
<b>Learning from Mistakes</b> <b>Instructional Implications</b>				
<b>*</b> Correct Answer (D)				

<b>A.10(E)</b> factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$ , including perfect square trinomials of degree two		<b>Analysis of Assessed Standards</b>		
2022 – Q46		<b>Cluster</b>	Simplifying Expressions	
<b>46</b>	Which function is equivalent to $k(x) = x^2 + 2x - 15$ ?	<b>Subcluster</b>	Polynomials	
<b>F</b>	$k(x) = (x + 15)(x - 1)$	<b>Content</b>	Readiness	
<b>G</b>	$k(x) = (x + 1)(x - 15)$	<b>Process</b>		
<b>H</b>	$k(x) = (x + 5)(x - 3)$	<b>Stimulus</b>		
<b>J</b>	$k(x) = (x + 3)(x - 5)$	<b>Data Analysis</b>		
		<b>Item</b>	<b>State</b>	<b>Local</b>
		F	7	
		G	14	
		H*	66	
		J	12	
<b>Error Analysis</b>				
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts				
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early				
<b>Learning from Mistakes</b> <b>Instructional Implications</b>				
<b>*</b> Correct Answer (H)				



A.10(F) decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial		Analysis of Assessed Standards	
2024 – Q47		Cluster	Simplifying Expressions
Choose two factors to create an expression equivalent to $4x^2 - 81$ .		Subcluster	Polynomials
Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.		Content	Supporting
		Process	
		Item Type	Drag and Drop (2 pts)
		Stimulus	
Data Analysis			
Item	State	Local	
Full Credit	40		
No Credit	23		
Partial Credit	37		
Error Analysis			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
Learning from Mistakes Instructional Implications			

**\*Correct Answer (2x + 9; 2x - 9)**

<b>A.10(F)</b> decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2022 – Q43	<b>Cluster</b>	Simplifying Expressions
		<b>Subcluster</b>	Polynomials
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	20	
	B*	55	
	C	16	
	D	9	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.11(A) simplify numerical radical expressions involving square roots</b>		<b>Analysis of Assessed Standards</b>	
2025 – Q3		<b>Cluster</b>	Simplifying Expressions
		<b>Subcluster</b>	Radicals
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A			
B*	81		
C			
D			
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b>			
<b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.11(A)</b> simplify numerical radical expressions involving square roots		<b>Analysis of Assessed Standards</b>			
2024 – Q1		<b>Cluster</b>	Simplifying Expressions		
		<b>Subcluster</b>	Radicals		
		<b>Content</b>	Supporting		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
	A				
	B				
	C				
	D*	80			
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes Instructional Implications</b>					

\*Correct Answer (D)

<b>A.11(A) simplify numerical radical expressions involving square roots</b>		<b>Analysis of Assessed Standards</b>	
2023 – Q20	Which expression is equivalent to $\sqrt{600}$ ?	<b>Cluster</b>	Simplifying Expressions
	<input type="radio"/> A $6\sqrt{10}$	<b>Subcluster</b>	Radicals
	<input type="radio"/> B $10\sqrt{6}$	<b>Content</b>	Supporting
	<input type="radio"/> C $24\sqrt{25}$	<b>Process</b>	
	<input type="radio"/> D $25\sqrt{24}$	<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A	9		
B*	73		
C	12		
D	6		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.11(B)</b> simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents		<b>Analysis of Assessed Standards</b>	
2025 – Q28		<b>Cluster</b>	Simplifying Expressions
In the expression shown, $x$ is a positive real number.		<b>Subcluster</b>	Exponents
$\frac{2x^{12}}{6x^{-3}}$		<b>Content</b>	Readiness
What is an equivalent form of this expression? Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.		<b>Process</b>	
<input type="button" value="-15"/> <input type="button" value="-9"/> <input type="button" value="-4"/> <input type="button" value="1/3"/> <input type="button" value="1/4"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="9"/> <input type="button" value="15"/> <input type="text"/> $x$ <input type="text"/>		<b>Item Type</b>	Drag and Drop (2 pts)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
Full Credit	24		
No Credit	45		
Partial Credit	31		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (1/3; 15)

<b>A.11(B)</b> simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents	<b>Analysis of Assessed Standards</b>		
<b>!</b> 2025 – Q48	<b>Cluster</b>	Simplifying Expressions	
Which expression is equivalent to $\frac{(6y^3)^{-2}}{y}$ for all values of $y$ where the expression is defined?	<b>Subcluster</b>	Exponents	
(A) $\frac{1}{36y^7}$	<b>Content</b>	Readiness	
(B) $\frac{1}{36y^6}$	<b>Process</b>		
(C) $\frac{1}{12y^7}$	<b>Item Type</b>	Multiple Choice (1 pt)	
(D) $\frac{1}{12y^6}$	<b>Stimulus</b>		
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A*	30	
	B		
	C		
	D		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (A)

A.11(B) simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents	Analysis of Assessed Standards	
! 2024 – Q6	Cluster	Simplifying Expressions
Which expression is equivalent to $\frac{1}{3}(6x^2y)^2(2x^3y^4)$ for all values of $x$ and $y$ where the expression is defined?	Subcluster	Exponents
	Content	Readiness
	Process	
	Item Type	Multiple Choice (1 pt)
	Stimulus	
	Data Analysis	
	Item	State
(A) $4x^7y^6$	A	
(B) $24x^7y^6$	B*	39
(C) $4x^{12}y^8$	C	
(D) $24x^{12}y^8$	D	
*Correct Answer (B)	Error Analysis	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	Learning from Mistakes Instructional Implications	

A.11(B) simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents	Analysis of Assessed Standards	
2024 – Q33	Cluster	Simplifying Expressions
Which expression is equivalent to $\frac{16k^9m^7}{4k^3m^{14}}$ for all values of $k$ and $m$ where the expression is defined?	Subcluster	Exponents
	Content	Readiness
	Process	
	Item Type	Multiple Choice (1 pt)
	Stimulus	
	Data Analysis	
	Item	State
(A) $\frac{12k^6}{m^7}$	A	
(B) $\frac{4k^6}{m^7}$	B*	52
(C) $\frac{12k^3}{m^2}$	C	
(D) $\frac{4k^3}{m^2}$	D	
*Correct Answer (B)	Error Analysis	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	Learning from Mistakes Instructional Implications	

<p><b>A.11(B)</b> simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents</p> <p>2023 – Q10</p> <p>Which expression is equivalent to <math>(x^{\frac{3}{7}})^2</math>?</p> <p>(A) <math>x^{\frac{6}{14}}</math></p> <p>(B) <math>x^{\frac{17}{7}}</math></p> <p>(C) <math>x^{\frac{6}{7}}</math></p> <p>(D) <math>x^{\frac{5}{7}}</math></p>	<b>Analysis of Assessed Standards</b>	
	<b>Cluster</b>	Simplifying Expressions
	<b>Subcluster</b>	Exponents
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Item Type</b>	Multiple Choice (1 pt)
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	A	43
	B	11
	C*	38
	D	7
	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

\*Correct Answer (C)

<p><b>A.11(B)</b> simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents</p> <p>! 2023 – Q35</p> <p>The expression <math>x^6y^3 \div \left(\frac{x^2}{y}\right)</math> can be written as a product of two exponential terms with bases <math>x</math> and <math>y</math> for all values of <math>x</math> and <math>y</math> where the expression is defined. Choose the correct value of the exponent for each term.</p> <p>Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.</p> <p><math>x</math> <input type="text"/> <math>y</math> <input type="text"/></p> <p><math>\begin{matrix} -3 &amp; 2 &amp; 3 &amp; 4 &amp; 8 \end{matrix}</math></p>	<b>Analysis of Assessed Standards</b>	
	<b>Cluster</b>	Simplifying Expressions
	<b>Subcluster</b>	Exponents
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Item Type</b>	Drag and Drop (2 pts)
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	Full Credit	4
	No Credit	58
	Partial Credit	38
	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

\*Correct Answer (4, 4)

<p><b>A.11(B)</b> simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents</p> <p>2022 – Q16</p> <p><b>16</b> Which expression is equivalent to <math>\frac{c^8(d^6)^3}{c^2}</math> for all values of <math>c</math> for which the expression is defined?</p> <p><b>F</b> <math>c^4d^9</math></p> <p><b>G</b> <math>c^4d^{18}</math></p> <p><b>H</b> <math>c^6d^9</math></p> <p><b>J</b> <math>c^6d^{18}</math></p>	<b>Analysis of Assessed Standards</b>	
	<b>Cluster</b>	Simplifying Expressions
	<b>Subcluster</b>	Exponents
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Stimulus</b>	
<b>Data Analysis</b>		
Item State Local		
<b>F</b>	<b>14</b>	
<b>G</b>	<b>25</b>	
<b>H</b>	<b>15</b>	
<b>J*</b>	<b>46</b>	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

\*Correct Answer (J)

<p><b>A.11(B)</b> simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents</p> <p>2022 – Q21</p> <p><b>21</b> Which expression is equivalent to <math>\frac{8.8 \times 10^9}{2.2 \times 10^{-3}}</math>?</p> <p><b>A</b> <math>4 \times 10^{12}</math></p> <p><b>B</b> <math>4 \times 10^6</math></p> <p><b>C</b> <math>4 \times 10^{-3}</math></p> <p><b>D</b> <math>4 \times 10^{-6}</math></p>	<b>Analysis of Assessed Standards</b>	
	<b>Cluster</b>	Simplifying Expressions
	<b>Subcluster</b>	Exponents
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Stimulus</b>	
<b>Data Analysis</b>		
Item State Local		
<b>A*</b>	<b>50</b>	
<b>B</b>	<b>27</b>	
<b>C</b>	<b>17</b>	
<b>D</b>	<b>6</b>	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

\*Correct Answer (A)



# Quadratic Functions

**A.6 Quadratic functions and equations.** The student applies the mathematical process standards when using properties of quadratic functions to write and represent in multiple ways, with and without technology, quadratic equations.

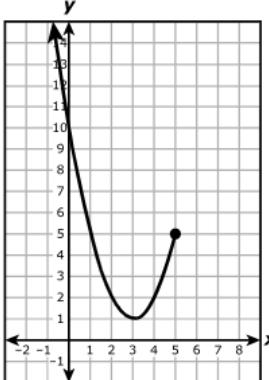
**A.7 Quadratic functions and equations.** The student applies the mathematical process standards when using graphs of quadratic functions and their related transformations to represent in multiple ways and determine, with and without technology, the solutions to equations.

**A.8 Quadratic functions and equations.** The student applies the mathematical process standards to solve, with and without technology, quadratic equations and evaluate the reasonableness of their solutions. The student formulates statistical relationships and evaluates their reasonableness based on real-world data.

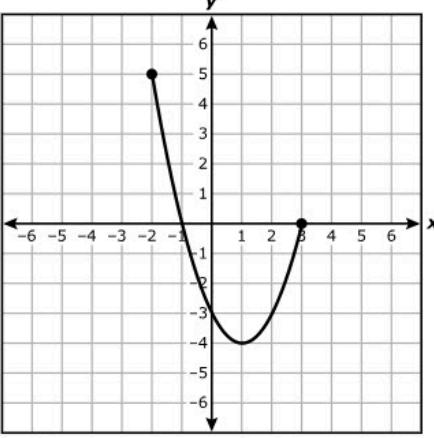
## Connected Knowledge and Skills A.12

<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities	<b>Analysis of Assessed Standards</b>		
<b>!</b> 2025 – Q5	<b>Cluster</b>	Quadratic Functions	
Which function has a range that is the set of all real numbers greater than or equal to – 1?	<b>Subcluster</b>	Describing Quadratic Functions	
(A) $f(x) = -x^2 - 1$	<b>Content</b>	Readiness	
(B) $f(x) = x^2 + 4x + 3$	<b>Process</b>		
(C) $f(x) = (x + 3)^2 + 1$	<b>Item Type</b>	Multiple Choice (1 pt)	
(D) $f(x) = (x + 4)^2 - 17$	<b>Stimulus</b>		
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A		
	B*	42	
	C		
	D		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b>			
<b>Instructional Implications</b>			

\*Correct Answer (B)

<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities	<b>Analysis of Assessed Standards</b>	
2025 – Q32	<b>Cluster</b>	Quadratic Functions
Part of a quadratic function is shown on the grid.	<b>Subcluster</b>	Describing Quadratic Functions
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Item Type</b>	Multiple Choice (1 pt)
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
(A) All real numbers less than or equal to 5	A*	60
(B) All real numbers greater than or equal to 3	B	
(C) All real numbers greater than or equal to 1	C	
(D) All real numbers	D	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		
<b>*Correct Answer (A)</b>		

<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities	<b>Analysis of Assessed Standards</b>		
!	2024 – Q9	<b>Cluster</b>	Quadratic Functions
	What is the range of the function $f(x) = -x^2 + 60x$ ?	<b>Subcluster</b>	Describing Quadratic Functions
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
	A		
	B		
	C		
	D*	34	
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	
*Correct Answer (D)			

<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities	<b>Analysis of Assessed Standards</b>	
<b>!</b> 2024 – Q32	<b>Cluster</b>	Quadratic Functions
A part of quadratic function $g$ is graphed on the grid.	<b>Subcluster</b>	Describing Quadratic Functions
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Item Type</b>	Multiple Choice (1 pt)
	<b>Stimulus</b>	
<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>
A		
B		
C		
D*	45	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

What is the domain of the part of the function shown?

- (A) All real numbers greater than or equal to  $-4$  and less than or equal to  $5$
- (B) All real numbers greater than or equal to  $-1$  and less than or equal to  $3$
- (C) All real numbers greater than or equal to  $-6$  and less than or equal to  $6$
- (D) All real numbers greater than or equal to  $-2$  and less than or equal to  $3$

\*Correct Answer (D)

<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities	<b>Analysis of Assessed Standards</b>		
<b>!</b> 2023 – Q11	<b>Cluster</b>	Quadratic Functions	
Which statement about the function $r(x) = 5x^2 - 20x + 12$ is true?	<b>Subcluster</b>	Describing Quadratic Functions	
<p><input type="radio"/> A The domain of the function is <math>x \geq 2</math>.</p> <p><input type="radio"/> B The range of the function is <math>r(x) \geq -8</math>.</p> <p><input type="radio"/> C The domain of the function is <math>x \geq 0</math>.</p> <p><input type="radio"/> D The range of the function is <math>r(x) \leq 12</math>.</p>	<b>Content</b>	Readiness	
	<b>Process</b>		
	<b>Item Type</b>	Multiple Choice (1 pt)	
	<b>Stimulus</b>		
	<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A	17	
	B*	47	
	C	11	
	D	25	
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b>			
<b>Instructional Implications</b>			

\*Correct Answer (B)

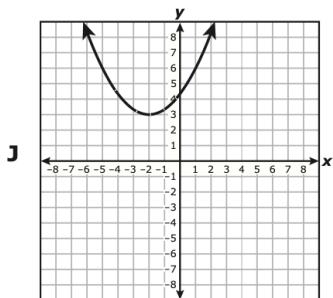
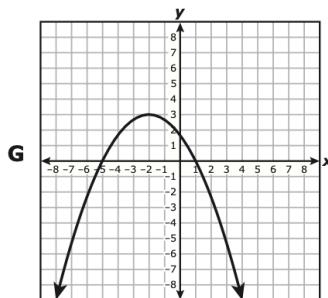
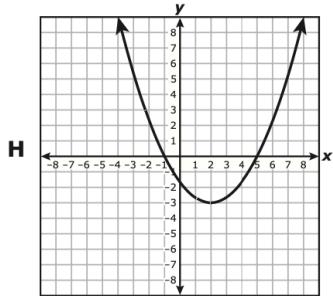
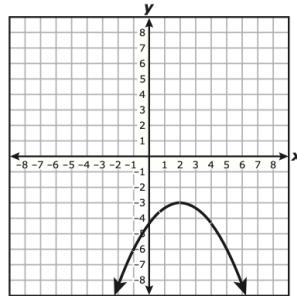
<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities	<b>Analysis of Assessed Standards</b>															
2023 – Q32  The table represents some points on the graph of quadratic function $g$ .  <table border="1"> <tr> <td><math>x</math></td><td><math>\frac{1}{2}</math></td><td>1</td><td><math>\frac{3}{2}</math></td><td>2</td><td><math>\frac{5}{2}</math></td><td>3</td></tr> <tr> <td><math>g(x)</math></td><td><math>\frac{7}{4}</math></td><td>4</td><td><math>\frac{19}{4}</math></td><td>4</td><td><math>\frac{7}{4}</math></td><td>-2</td></tr> </table> <p>What is the range of <math>g</math>?</p> <p> <input type="radio"/> A All real numbers less than or equal to <math>\frac{3}{2}</math>  <input type="radio"/> B All real numbers less than or equal to <math>\frac{19}{4}</math>  <input type="radio"/> C All real numbers greater than or equal to <math>\frac{3}{2}</math>  <input type="radio"/> D All real numbers greater than or equal to <math>\frac{19}{4}</math> </p>	$x$	$\frac{1}{2}$	1	$\frac{3}{2}$	2	$\frac{5}{2}$	3	$g(x)$	$\frac{7}{4}$	4	$\frac{19}{4}$	4	$\frac{7}{4}$	-2	<b>Cluster</b> Quadratic Functions <b>Subcluster</b> Describing Quadratic Functions <b>Content</b> Readiness <b>Process</b> <b>Item Type</b> Multiple Choice (1 pt) <b>Stimulus</b>	
$x$	$\frac{1}{2}$	1	$\frac{3}{2}$	2	$\frac{5}{2}$	3										
$g(x)$	$\frac{7}{4}$	4	$\frac{19}{4}$	4	$\frac{7}{4}$	-2										
	<b>Data Analysis</b> <table border="1"> <thead> <tr> <th>Item</th><th>State</th><th>Local</th></tr> </thead> <tbody> <tr> <td>A</td><td>19</td><td></td></tr> <tr> <td>B*</td><td>44</td><td></td></tr> <tr> <td>C</td><td>25</td><td></td></tr> <tr> <td>D</td><td>12</td><td></td></tr> </tbody> </table> <b>Error Analysis</b> <p> <input type="checkbox"/> Guessing      <input type="checkbox"/> Mixed Up Concepts  <input type="checkbox"/> Careless Error    <input type="checkbox"/> Stopped Too Early     </p> <b>Learning from Mistakes</b> <b>Instructional Implications</b>	Item	State	Local	A	19		B*	44		C	25		D	12	
Item	State	Local														
A	19															
B*	44															
C	25															
D	12															

\*Correct Answer (B)

**A.6(A)** determine the domain and range of quadratic functions and represent the domain and range using inequalities

2022 – Q6

- 6 Which graph best represents a quadratic function with a range of all real numbers greater than or equal to 3?



\*Correct Answer (J)

### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Stimulus	

### Data Analysis

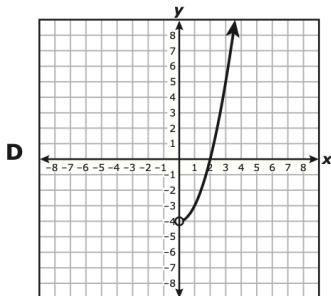
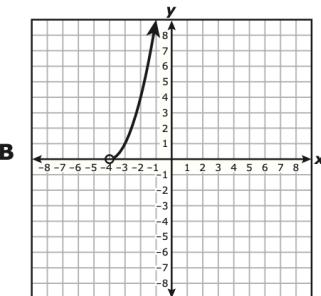
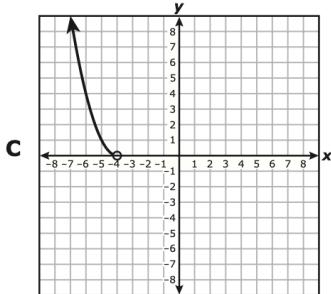
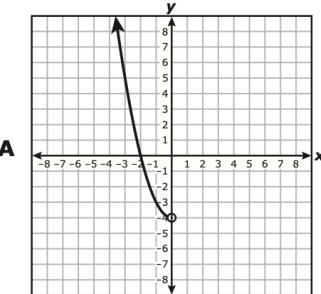
Item	State	Local
F	4	
G	13	
H	17	
J*	66	

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.6(A)</b> determine the domain and range of quadratic functions and represent the domain and range using inequalities		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2022 – Q47	<b>Cluster</b>	Quadratic Functions
<b>Subcluster</b>	Describing Quadratic Functions	<b>Content</b>	Readiness
<b>Process</b>		<b>Stimulus</b>	
<b>Data Analysis</b>			
<b>Item</b>	<b>State</b>	<b>Local</b>	
A	17		
B	15		
C*	56		
D	11		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			



\*Correct Answer (C)

**A.6(B)** write equations of quadratic functions given the vertex and another point on the graph, write the equation in vertex form ( $f(x) = a(x - h)^2 + k$ ), and rewrite the equation from vertex form to standard form ( $f(x) = ax^2 + bx + c$ )

2025 – Q41

Quadratic function  $f$  has vertex  $(5, -1)$  and passes through  $(3, -17)$ . What is the equation for  $f$  in standard form?

A  $f(x) = -4x^2 + 40x - 101$

B  $f(x) = 4x^2 - 40x + 99$

C  $f(x) = -4x^2 - 101$

D  $f(x) = 4x^2 + 99$

#### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Writing and Solving Quadratic Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A*	56	
B		
C		
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (A)

**A.6(B)** write equations of quadratic functions given the vertex and another point on the graph, write the equation in vertex form ( $f(x) = a(x - h)^2 + k$ ), and rewrite the equation from vertex form to standard form ( $f(x) = ax^2 + bx + c$ )

2024 – Q40

Which function is equivalent to  $f(x) = 4(x - 3)^2 + 5$ ?

(A)  $f(x) = 16x^2 - 96x + 149$

(B)  $f(x) = 4x^2 + 41$

(C)  $f(x) = 4x^2 - 24x + 41$

(D)  $f(x) = 16x^2 - 96x + 29$

\*Correct Answer (C)

#### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Writing and Solving Quadratic Equations
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C*	64	
D		

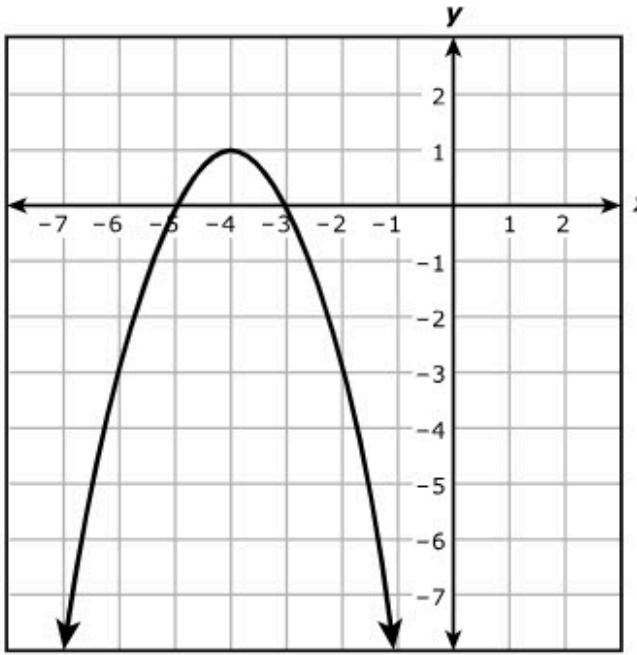
#### Error Analysis

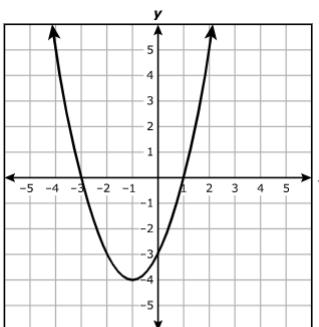
- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<p><b>A.6(B)</b> write equations of quadratic functions given the vertex and another point on the graph, write the equation in vertex form (<math>f(x) = a(x - h)^2 + k</math>), and rewrite the equation from vertex form to standard form (<math>f(x) = ax^2 + bx + c</math>)</p>	<p><b>Analysis of Assessed Standards</b></p>															
<p><b>!</b> 2023 – Q25</p> <p>Which quadratic function in vertex form can be represented by the graph that has a vertex at (1, 46) and passes through the point (3, 10)?</p>	<p><b>Cluster</b> Quadratic Functions</p>															
	<p><b>Subcluster</b> Writing and Solving Quadratic Equations</p>															
	<p><b>Content</b> Supporting</p>															
	<p><b>Process</b></p>															
	<p><b>Item Type</b> Multiple Choice (1 pt)</p>															
<p><b>Stimulus</b></p> <p>Which quadratic function in vertex form can be represented by the graph that has a vertex at (1, 46) and passes through the point (3, 10)?</p> <p>(A) <math>y = 9(x - 3)^2 + 10</math></p> <p>(B) <math>y = 9(x - 1)^2 + 46</math></p> <p>(C) <math>y = -9(x - 3)^2 + 10</math></p> <p>(D) <math>y = -9(x - 1)^2 + 46</math></p>	<p><b>Data Analysis</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; background-color: #cccccc;">Item</th> <th style="text-align: center; background-color: #cccccc;">State</th> <th style="text-align: center; background-color: #cccccc;">Local</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">23</td> <td></td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">20</td> <td></td> </tr> <tr> <td style="text-align: center;">C</td> <td style="text-align: center;">17</td> <td></td> </tr> <tr> <td style="text-align: center;">D*</td> <td style="text-align: center;">40</td> <td></td> </tr> </tbody> </table>	Item	State	Local	A	23		B	20		C	17		D*	40	
	Item	State	Local													
	A	23														
	B	20														
	C	17														
D*	40															
<p><b>Error Analysis</b></p> <p><input type="checkbox"/> Guessing    <input type="checkbox"/> Mixed Up Concepts</p> <p><input type="checkbox"/> Careless Error    <input type="checkbox"/> Stopped Too Early</p>																
<p><b>Learning from Mistakes</b> <b>Instructional Implications</b></p>																

\*Correct Answer (D)

A.6(C) write quadratic functions when given real solutions and graphs of their related equations		Analysis of Assessed Standards							
2024 – Q2									
The graph of quadratic function $h$ is shown on the grid.									
									
Which function is best represented by the graph of $h$ ?									
(A) $h(x) = -x^2 - 8x - 15$									
(B) $h(x) = -x^2 + 8x - 15$									
(C) $h(x) = x^2 + 8x + 15$									
(D) $h(x) = x^2 - 8x + 15$									
*Correct Answer (A)									
Data Analysis									
Item	State	Local							
A*	77								
B									
C									
D									
Error Analysis									
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts								
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early								
Learning from Mistakes Instructional Implications									

<b>A.6(C)</b> write quadratic functions when given real solutions and graphs of their related equations		<b>Analysis of Assessed Standards</b>	
2023 – Q3	The graph of quadratic function $h$ is shown.	<b>Cluster</b>	Quadratic Functions
		<b>Subcluster</b>	Writing and Solving Quadratic Equations
		<b>Content</b>	Supporting
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	A*	74	
	B	9	
	C	6	
	D	10	
<b>Error Analysis</b>			
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (A)

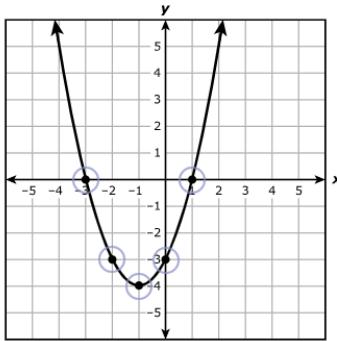
<b>A.6(C)</b> write quadratic functions when given real solutions and graphs of their related equations		<b>Analysis of Assessed Standards</b>	
2022 – Q24		<b>Cluster</b>	Quadratic Functions
<b>24</b> The solutions to $p(x) = 0$ are $x = -7$ and $x = 7$ . Which quadratic function could represent $p$ ?		<b>Subcluster</b>	Writing and Solving Quadratic Equations
<b>F</b> $p(x) = x^2 - 49$		<b>Content</b>	Supporting
<b>G</b> $p(x) = x^2 + 49$		<b>Process</b>	
<b>H</b> $p(x) = x^2 - 14$		<b>Stimulus</b>	
<b>J</b> $p(x) = x^2 + 14$		<b>Data Analysis</b>	
*Correct Answer (F)		<b>Item</b>	<b>State</b>
		F*	61
		G	14
		H	16
		J	9
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

**A.7(A)** graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry

2025 – Q15

A graph of a quadratic function is shown. Which location best represents the y-intercept of the function?

Select **ONE** correct answer.



\*Correct Answer (Point at (0, -3))

#### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Hot Spot (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
Full Credit	86	
No Credit	14	

#### Error Analysis

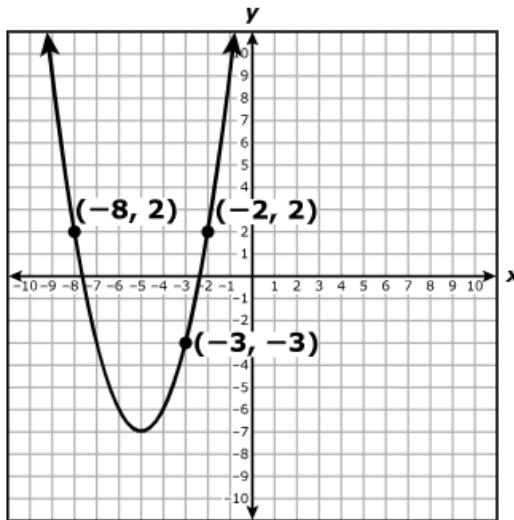
- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.7(A)** graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry

2025 – Q21

The graph of quadratic function  $f$  is shown on the grid.



Which equation represents the axis of symmetry of the graph of  $f$ ?

(A)  $x = -5$

(B)  $x = -3$

(C)  $y = -7$

(D)  $y = 2$

\*Correct Answer (A)

### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A*	59	
B		
C		
D		

### Error Analysis

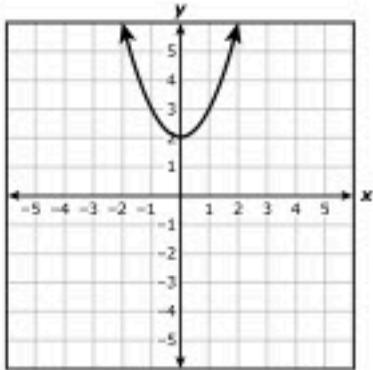
- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

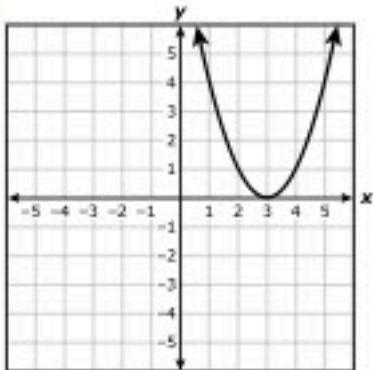
<b>A.7(A)</b> graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry	<b>Analysis of Assessed Standards</b>	
2024 – Q4	<b>Cluster</b>	Quadratic Functions
	<b>Subcluster</b>	Describing Quadratic Functions

Which graph best represents a quadratic function that has no real zeros?

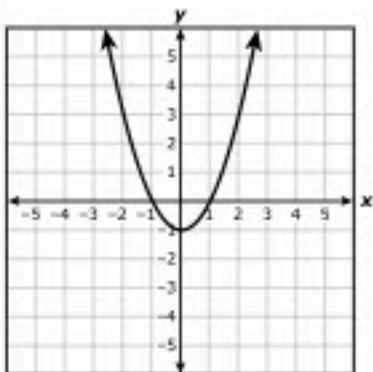
(A)



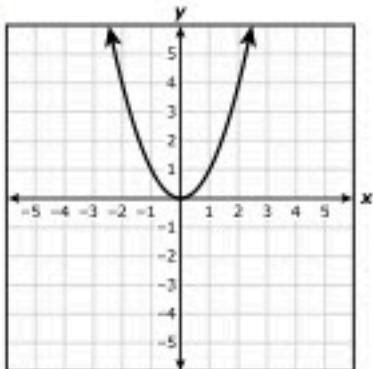
(B)



(C)



(D)



<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

<b>Data Analysis</b>		
Item	State	Local
A*	58	
B		
C		
D		

**Error Analysis**

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

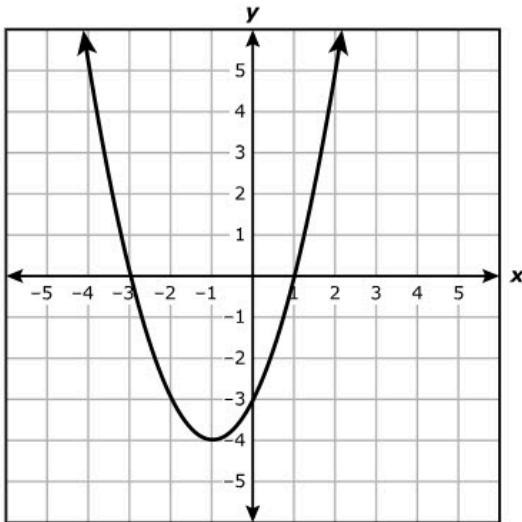
**Learning from Mistakes  
Instructional Implications**

\*Correct Answer (A)

**A.7(A)** graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry

2024 – Q25

A graph of a quadratic function is shown on the grid.



Complete the statement about the quadratic function.

Move the correct answer to each box. Not all answers will be used.

minimum    maximum    -4    -3    -1    0    1

The function has a [ ] value of [ ].

#### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Drag and Drop (2 pts)
Stimulus	

#### Data Analysis

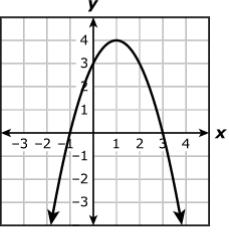
Item	State	Local
Full Credit	64	
No Credit	10	
Partial Credit	26	

#### Error Analysis

- Guessing     Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (minimum; -4)

<p><b>A.7(A)</b> graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry</p>	<p><b>Analysis of Assessed Standards</b></p>															
<p>2023 – Q19</p> <p>The graph of a quadratic function is shown on the grid.</p> 	<p><b>Cluster</b> Quadratic Functions  <b>Subcluster</b> Describing Quadratic Functions  <b>Content</b> Readiness  <b>Process</b>  <b>Item Type</b> Multiple Choice (1 pt)  <b>Stimulus</b></p>															
<p>Which statement appears to be true?</p> <ul style="list-style-type: none"> <li><input type="radio"/> A The function has 3 zeros.</li> <li><input type="radio"/> B The maximum value of the function is 3.</li> <li><input type="radio"/> C The vertex of the graph of the function is <math>(4, 1)</math>.</li> <li><input type="radio"/> D The equation of the axis of symmetry of the graph of the function is <math>x = 1</math>.</li> </ul>	<p><b>Data Analysis</b></p> <table border="1"> <thead> <tr> <th>Item</th> <th>State</th> <th>Local</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>8</td> <td></td> </tr> <tr> <td>B</td> <td>11</td> <td></td> </tr> <tr> <td>C</td> <td>29</td> <td></td> </tr> <tr> <td>D*</td> <td>52</td> <td></td> </tr> </tbody> </table> <p><b>Error Analysis</b></p> <p><input type="checkbox"/> Guessing    <input type="checkbox"/> Mixed Up Concepts  <input type="checkbox"/> Careless Error    <input type="checkbox"/> Stopped Too Early</p> <p><b>Learning from Mistakes</b>  <b>Instructional Implications</b></p>	Item	State	Local	A	8		B	11		C	29		D*	52	
Item	State	Local														
A	8															
B	11															
C	29															
D*	52															
<p>*Correct Answer (D)</p>																

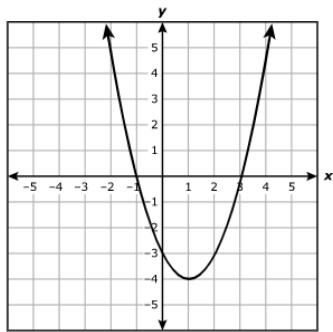
**A.7(A)** graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry

### Analysis of Assessed Standards

<b>Cluster</b>	Quadratic Functions
<b>Subcluster</b>	Describing Quadratic Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiselect (2 pts)
<b>Stimulus</b>	

! 2023 – Q49

The graph of a quadratic function is shown.



Which values best represent the zeros of the function?

Select **TWO** correct answers.

- $x = 1$
- $x = -4$
- $x = -1$
- $x = 3$
- $x = 0$
- $x = -3$

\*Correct Answer (C, D)

### Data Analysis

Item	State	Local
Full Credit	69	
No Credit	10	
Partial Credit	21	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.7(A)** graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry

### Analysis of Assessed Standards

<b>Cluster</b>	Quadratic Functions
<b>Subcluster</b>	Describing Quadratic Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
A	4	
B	20	
C	5	
D*	70	

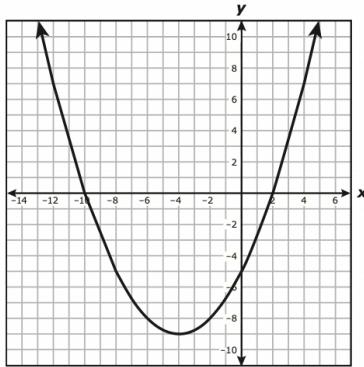
### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

! 2022 – Q1

1 The graph of quadratic function  $r$  is shown on the grid.



Which answer choice best represents the intercepts of the graph of  $r$ ?

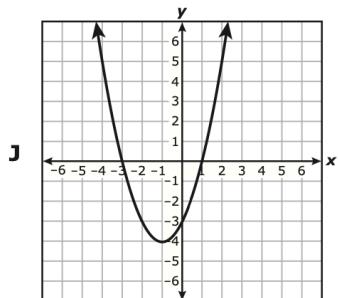
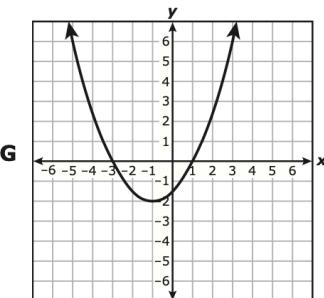
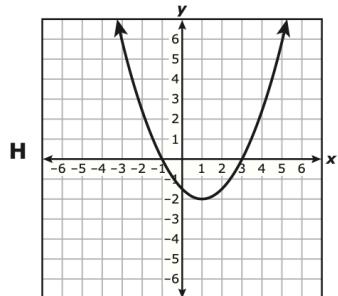
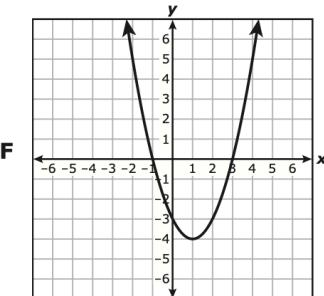
- A** x-intercept: (5, 0)  
y-intercepts: (0, 10) and (0, -2)
- B** x-intercepts: (0, -10) and (0, 2)  
y-intercept: (-5, 0)
- C** x-intercept: (0, 5)  
y-intercepts: (10, 0) and (-2, 0)
- D** x-intercepts: (-10, 0) and (2, 0)  
y-intercept: (0, -5)

\*Correct Answer (D)

**A.7(A)** graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry

2022 – Q40

**40** Which graph best represents  $h(x) = (x + 1)(x - 3)$ ?



\*Correct Answer (F)

### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Stimulus	

### Data Analysis

Item	State	Local
F*	67	
G	11	
H	9	
J	13	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.7(B)</b> describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions	Analysis of Assessed Standards				
	Cluster	Quadratic Functions			
Subcluster	Writing and Solving Quadratic Equations				
Content	Supporting				
Process					
Item Type	Multiple Choice (1 pt)				
Stimulus					
Data Analysis					
Item	State	Local			
A					
B					
C*	64				
D					
Error Analysis					
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts				
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early				
Learning from Mistakes Instructional Implications					
*Correct Answer (C)					

<b>A.7(B)</b> describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions	<b>Analysis of Assessed Standards</b>	
!	Cluster	Quadratic Functions
2024 – Q34	Subcluster	Writing and Solving Quadratic Equations
	Content	Supporting
	Process	
	Item Type	Drag and Drop (2 pts)
	Stimulus	
	<b>Data Analysis</b>	
	Item	State
	Full Credit	17
	No Credit	47
	Partial Credit	36
	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	
*Correct Answer ((2x + 3); (x - 5))		

<b>A.7(B)</b> describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions		<b>Analysis of Assessed Standards</b>	
<b>!</b>	2023 – Q8	<b>Cluster</b>	Quadratic Functions
	Which statement about $f(x) = 4x^2 - 36x + 81$ is true?	<b>Subcluster</b>	Writing and Solving Quadratic Equations
	<input type="radio"/> A The zeros are $\frac{3}{4}$ and $-27$ because $f(x) = (4x - 3)(x - 27)$ .	<b>Content</b>	Supporting
	<input type="radio"/> B The zeros are $-\frac{3}{2}$ and $\frac{27}{2}$ because $f(x) = (2x + 3)(2x + 27)$ .	<b>Process</b>	
	<input type="radio"/> C The zeros are $\pm \frac{9}{2}$ because $f(x) = (2x - 9)(2x + 9)$ .	<b>Item Type</b>	Multiple Choice (1 pt)
	<input type="radio"/> D The only zero is $\frac{9}{2}$ because $f(x) = (2x - 9)^2$ .	<b>Stimulus</b>	
		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		A	13
		B	17
		C	17
		D*	53
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b>	
		<b>Instructional Implications</b>	
<b>*</b> Correct Answer (D)			

<b>A.7(B)</b> describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions		<b>Analysis of Assessed Standards</b>	
2022 – Q30		<b>Cluster</b>	Quadratic Functions
<b>30</b> Given $f(x) = x^2 - 36$ , which statement is true?		<b>Subcluster</b>	Writing and Solving Quadratic Equations
<b>F</b> The only zero, 6, can be found when $0 = (x - 6)(x - 6)$ .		<b>Content</b>	Supporting
<b>G</b> The only zero, 18, can be found when $0 = (x - 18)(x - 18)$ .		<b>Process</b>	
<b>H</b> The zeros, $-6$ and $6$ , can be found when $0 = (x + 6)(x - 6)$ .		<b>Stimulus</b>	
<b>J</b> The zeros, $-18$ and $18$ , can be found when $0 = (x + 18)(x - 18)$ .		<b>Data Analysis</b>	
		<b>Item</b>	<b>State</b>
		F	12
		G	10
		H*	70
		J	8
		<b>Error Analysis</b>	
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
		<b>Learning from Mistakes</b>	
		<b>Instructional Implications</b>	
<b>*</b> Correct Answer (H)			



## IQ Analysis | Investigating the Question

A.7(C)

RC 4

**A.7(C)** determine the effects on the graph of the parent function  $f(x) = x^2$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

2025 – Q12

The quadratic function  $f(x) = x^2$  with vertex  $(0, 0)$  has been transformed to create  $g(x) = f(x + 8.7)$ . What is the vertex of  $g$ ?

 A (0, 8.7) B (0, -8.7) C (8.7, 0) D (-8.7, 0)

## Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

## Data Analysis

Item	State	Local
A		
B		
C		
D*	41	

## Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

Learning from Mistakes  
Instructional Implications

\*Correct Answer (D)

**A.7(C)** determine the effects on the graph of the parent function  $f(x) = x^2$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

2025 – Q39

The quadratic function  $f(x) = x^2$  is transformed to create the function  $g(x) = f(x - 6) + 2$ .

Choose the correct answer from each drop-down menu to complete the sentence.

The graph of  $f$  is translated 6 units  ⬇ and 2 units  ⬆ to create the graph of function  $g$ .

#### Analysis of Assessed Standards

<b>Cluster</b>	Quadratic Functions
<b>Subcluster</b>	Describing Quadratic Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Inline Choice (2 pts)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
Full Credit	36	
No Credit	37	
Partial Credit	27	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

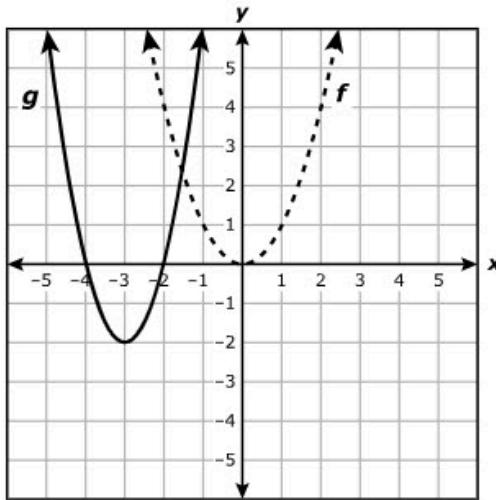
#### Learning from Mistakes Instructional Implications

\*Correct Answer (right; up)

**A.7(C)** determine the effects on the graph of the parent function  $f(x) = x^2$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

! 2024 – Q21

The quadratic function  $f(x) = x^2$  is transformed to create  $g$  as shown in the graph.



What is the equation for  $g$ ?

(A)  $g(x) = f(x + 3) - 2$

(B)  $g(x) = 2f(x + 3) - 2$

(C)  $g(x) = f(x - 3) + 2$

(D)  $g(x) = 2f(x - 3) + 2$

\*Correct Answer (B)

### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A		
B*	44	
C		
D		

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.7(C)** determine the effects on the graph of the parent function  $f(x) = x^2$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

2024 – Q29

If  $f(x) = x^2$  and  $g(x) = f(x + 7.2)$ , what is the vertex of the graph of  $g$ ?

(A)  $(7.2, 0)$

(B)  $(-7.2, 0)$

(C)  $(0, 7.2)$

(D)  $(0, -7.2)$

\*Correct Answer (B)

### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A		
B*	41	
C		
D		

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.7(C)** determine the effects on the graph of the parent function  $f(x) = x^2$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

! 2023 – Q38

The function  $f(x) = x^2$  was transformed to create the function  $g(x) = f(x - 3) - 9$ . What are the coordinates of the vertex of the graph of  $g$ ?

Move the correct answer to each box. Not all answers will be used.

-9   -3   0   3   9

( [ ] , [ ] )

#### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Item Type	Drag and Drop (2 pts)
Stimulus	

#### Data Analysis

Item	State	Local
Full Credit	30	
No Credit	35	
Partial Credit	35	

#### Error Analysis

- Guessing    Mixed Up Concepts  
 Careless Error    Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (3, -9)

**A.7(C)** determine the effects on the graph of the parent function  $f(x) = x^2$  when  $f(x)$  is replaced by  $af(x)$ ,  $f(x) + d$ ,  $f(x - c)$ ,  $f(bx)$  for specific values of  $a$ ,  $b$ ,  $c$ , and  $d$

2022 – Q13

13 Which answer choice describes how the graph of  $f(x) = x^2$  was transformed to create the graph of  $n(x) = x^2 - 1$ ?

- A A vertical shift up
- B A horizontal shift to the left
- C A vertical shift down
- D A horizontal shift to the right

#### Analysis of Assessed Standards

Cluster	Quadratic Functions
Subcluster	Describing Quadratic Functions
Content	Readiness
Process	
Stimulus	

#### Data Analysis

Item	State	Local
A	11	
B	13	
C*	67	
D	8	

#### Error Analysis

- Guessing    Mixed Up Concepts  
 Careless Error    Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (C)

<b>A.7(C)</b> determine the effects on the graph of the parent function $f(x) = x^2$ when $f(x)$ is replaced by $af(x)$ , $f(x) + d$ , $f(x - c)$ , $f(bx)$ for specific values of $a$ , $b$ , $c$ , and $d$	<b>Analysis of Assessed Standards</b>															
2022 – Q50  <b>50</b> Quadratic functions $p$ and $q$ are graphed on the grid. The graph of $p$ was transformed to create the graph of $q$ .	<b>Cluster</b> Quadratic Functions <b>Subcluster</b> Describing Quadratic Functions <b>Content</b> Readiness <b>Process</b> <b>Stimulus</b>															
	<b>Data Analysis</b> <table border="1"> <thead> <tr> <th>Item</th> <th>State</th> <th>Local</th> </tr> </thead> <tbody> <tr> <td>F</td> <td>11</td> <td></td> </tr> <tr> <td>G</td> <td>17</td> <td></td> </tr> <tr> <td>H</td> <td>11</td> <td></td> </tr> <tr> <td>J*</td> <td>60</td> <td></td> </tr> </tbody> </table>	Item	State	Local	F	11		G	17		H	11		J*	60	
Item	State	Local														
F	11															
G	17															
H	11															
J*	60															
Which function best represents the graph of $q$ ?  <b>F</b> $q(x) = -(x - 2)^2$ <b>G</b> $q(x) = -(x + 2)^2$ <b>H</b> $q(x) = -x^2 - 2$ <b>J</b> $q(x) = -x^2 + 2$  <b>*Correct Answer (J)</b>	<b>Error Analysis</b> <input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early  <b>Learning from Mistakes</b> <b>Instructional Implications</b>															

**A.8(A)** solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula

! 2025 – Q26

The equation  $x(x + 3) = 108$  can be used to find the width,  $x$ , of a rectangular deck that has an area of 108 square feet. What is the width of the deck in feet?

(A) 6 ft

(B) 4 ft

(C) 9 ft

(D) 3 ft

\*Correct Answer (C)

#### Analysis of Assessed Standards

<b>Cluster</b>	Quadratic Functions
<b>Subcluster</b>	Writing and Solving Quadratic Equations
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
A		
B		
C*	56	
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<b>A.8(A)</b> solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	<b>Analysis of Assessed Standards</b>	
2025 – Q36	<b>Cluster</b>	Quadratic Functions
What are the solutions to the equation $(2x + 1)^2 = 25$ ?	<b>Subcluster</b>	Writing and Solving Quadratic Equations
Move the correct answer to each box. Not all answers will be used.	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Item Type</b>	Drag and Drop (2 pts)
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
$x =$ <input type="text"/>	<b>Item</b>	<b>State</b>
$x =$ <input type="text"/>	<b>Full Credit</b>	34
	<b>No Credit</b>	25
	<b>Partial Credit</b>	42
	<b>Error Analysis</b>	
*Correct Answer (-3; 2)	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b>	
	<b>Instructional Implications</b>	

<b>A.8(A)</b> solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	<b>Analysis of Assessed Standards</b>	
2024 – Q18	<b>Cluster</b>	Quadratic Functions
Function $g$ is defined by $g(x) = 3x^2 - 2x - 5$ . What are the solutions to $g(x) = 0$ ?	<b>Subcluster</b>	Writing and Solving Quadratic Equations
	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Item Type</b>	Multiple Choice (1 pt)
	<b>Stimulus</b>	
<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>
	A	
	B*	54
	C	
	D	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		

\*Correct Answer (B)

<b>A.8(A)</b> solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	<b>Analysis of Assessed Standards</b>	
!	Cluster	Quadratic Functions
2024 – Q31	Subcluster	Writing and Solving Quadratic Equations
	Content	Readiness
	Process	
	Item Type	Multiple Choice (1 pt)
	Stimulus	
	<b>Data Analysis</b>	
	Item	State
	A	
	B	
	C	
	D*	30
	<b>Error Analysis</b>	
	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
*	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

<b>A.8(A)</b> solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	<b>Analysis of Assessed Standards</b>	
<b>!</b> 2023 – Q41	<b>Cluster</b>	Quadratic Functions
Function $k$ is defined as $k(x) = x^2 + 32x + 248$ . What are the solutions to $k(x) = 0$ ?	<b>Subcluster</b>	Writing and Solving Quadratic Equations
(A) $x = -16 + 2\sqrt{2}$ and $x = -16 - 2\sqrt{2}$	<b>Content</b>	Readiness
(B) $x = 16 + 2\sqrt{2}$ and $x = 16 - 2\sqrt{2}$	<b>Process</b>	
(C) $x = -32 + 4\sqrt{2}$ and $x = -32 - 4\sqrt{2}$	<b>Item Type</b>	Multiple Choice (1 pt)
(D) $x = 32 + 4\sqrt{2}$ and $x = 32 - 4\sqrt{2}$	<b>Stimulus</b>	
<b>Data Analysis</b>		
	<b>Item</b>	<b>State</b>
	A*	30
	B	28
	C	27
	D	14
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		
<b>*</b> Correct Answer (A)		

<b>A.8(A)</b> solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	<b>Analysis of Assessed Standards</b>	
2022 – Q17	<b>Cluster</b>	Quadratic Functions
<b>17</b> Which value of $x$ is the solution to this equation?	<b>Subcluster</b>	Writing and Solving Quadratic Equations
$5x^2 = 30x - 45$	<b>Content</b>	Readiness
<b>A</b> $x = 3$	<b>Process</b>	
<b>B</b> $x = -3$	<b>Stimulus</b>	
<b>C</b> $x = 5$	<b>Data Analysis</b>	
<b>D</b> $x = -5$	<b>Item</b>	<b>State</b>
	A*	56
	B	15
	C	18
	D	11
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>		
<b>*</b> Correct Answer (A)		

<b>A.8(A)</b> solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	<b>Analysis of Assessed Standards</b>	
2022 – Q27	<b>Cluster</b>	Quadratic Functions
<b>27</b> What is the positive solution to $x^2 + 9x - 22 = 0$ ?	<b>Subcluster</b>	Writing and Solving Quadratic Equations
Record your answer and fill in the bubbles on your answer document.	<b>Content</b>	Readiness
	<b>Process</b>	
	<b>Stimulus</b>	
	<b>Data Analysis</b>	
	<b>Item</b>	<b>State</b>
	2	45*
		54
	<b>Error Analysis</b>	
*Correct Answer (2)	<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts
	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
	<b>Learning from Mistakes</b> <b>Instructional Implications</b>	

A.8(B) write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems		Analysis of Assessed Standards			
<b>!</b> 2023 – Q13		<b>Cluster</b>	Quadratic Functions		
An experiment examined the relationship between the number of miles a car traveled, $y$ , per gallon of gasoline and the speed of the car, $x$ , in miles per hour. The table displays the data collected.		<b>Subcluster</b>	Writing and Solving Quadratic Equations		
		<b>Content</b>	Supporting		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
(A) 27.9	A*	41			
(B) 31.0	B	32			
(C) 40.2	C	9			
(D) 24.9	D	17			
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					

\*Correct Answer (A)

<b>A.8(B)</b> write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems	<b>Analysis of Assessed Standards</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Cluster</td><td>Quadratic Functions</td></tr> <tr> <td>Subcluster</td><td>Writing and Solving Quadratic Equations</td></tr> <tr> <td>Content</td><td>Supporting</td></tr> <tr> <td>Process</td><td></td></tr> <tr> <td>Stimulus</td><td></td></tr> </table> <b>Data Analysis</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Item</th><th style="width: 15%;">State</th><th style="width: 15%;">Local</th></tr> <tr> <td>F</td><td>12</td><td></td></tr> <tr> <td>G</td><td>14</td><td></td></tr> <tr> <td>H*</td><td>63</td><td></td></tr> <tr> <td>J</td><td>11</td><td></td></tr> </table> <b>Error Analysis</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><input type="checkbox"/> Guessing</td><td style="width: 50%;"><input type="checkbox"/> Mixed Up Concepts</td></tr> <tr> <td><input type="checkbox"/> Careless Error</td><td><input type="checkbox"/> Stopped Too Early</td></tr> </table> <b>Learning from Mistakes</b> <b>Instructional Implications</b>				Cluster	Quadratic Functions	Subcluster	Writing and Solving Quadratic Equations	Content	Supporting	Process		Stimulus		Item	State	Local	F	12		G	14		H*	63		J	11		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
Cluster	Quadratic Functions																																
Subcluster	Writing and Solving Quadratic Equations																																
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<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early																																
2022 – Q22	<p><b>22</b> A person dives into a pool from its edge to swim to the other side. The table shows the depth in feet of the person from the surface of the water after <math>x</math> seconds. The data can be modeled by a quadratic function.</p> <p style="text-align: center;"><b>Pool</b></p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Time, <math>x</math> (seconds)</th><th style="text-align: left;">Depth of Person from Surface of Water, <math>d(x)</math> (feet)</th></tr> </thead> <tbody> <tr> <td>1</td><td>-2.85</td></tr> <tr> <td>4</td><td>-8.28</td></tr> <tr> <td>6</td><td>-9.3</td></tr> <tr> <td>8.5</td><td>-7.65</td></tr> <tr> <td>10</td><td>-5.1</td></tr> <tr> <td>11.5</td><td>-1.38</td></tr> </tbody> </table> <p>Which function best models the data?</p> <p><b>F</b> <math>d(x) = 0.05x^2 + 0.74x</math></p> <p><b>G</b> <math>d(x) = 0.05x^2 + 0.74x + 9.17</math></p> <p><b>H</b> <math>d(x) = 0.26x^2 - 3.11x</math></p> <p><b>J</b> <math>d(x) = 0.26x^2 - 3.11x + 1</math></p> <p>*Correct Answer (H)</p>				Time, $x$ (seconds)	Depth of Person from Surface of Water, $d(x)$ (feet)	1	-2.85	4	-8.28	6	-9.3	8.5	-7.65	10	-5.1	11.5	-1.38															
Time, $x$ (seconds)	Depth of Person from Surface of Water, $d(x)$ (feet)																																
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11.5	-1.38																																

A.12(B) evaluate functions, expressed in function notation, given one or more elements in their domains		Analysis of Assessed Standards		
<b>!</b> 2025 – Q17		<b>Cluster</b>	Quadratic Functions	
		<b>Subcluster</b>	Describing Quadratic Functions	
		<b>Content</b>	Supporting	
		<b>Process</b>		
		<b>Item Type</b>	Equation Editor (1 pt)	
		<b>Stimulus</b>		
<b>Data Analysis</b>				
	<b>Item</b>	<b>State</b>	<b>Local</b>	
	Full Credit	44		
	No Credit	56		
<b>Error Analysis</b>				
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early				
<b>Learning from Mistakes</b> <b>Instructional Implications</b>				

A function is shown.

$$f(x) = 3(x - 4)^2 - 7$$

What is the value of  $f(-1)$ ?

Enter your answer in the box provided.

⬅
➡
⟲
⟳
✖

1	2	3
4	5	6
7	8	9
	0	
.	-	÷

\*Correct Answer (68)

<b>A.12(B)</b> evaluate functions, expressed in function notation, given one or more elements in their domains		<b>Analysis of Assessed Standards</b>			
2024 – Q48		<b>Cluster</b>	Quadratic Functions		
		<b>Subcluster</b>	Describing Quadratic Functions		
		<b>Content</b>	Supporting		
		<b>Process</b>			
		<b>Item Type</b>	Multiple Choice (1 pt)		
		<b>Stimulus</b>			
<b>Data Analysis</b>					
	<b>Item</b>	<b>State</b>	<b>Local</b>		
	A				
	B				
	C*	57			
	D				
<b>Error Analysis</b>					
<input type="checkbox"/> Guessing		<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error		<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>					

\*Correct Answer (C)

# Exponential Functions

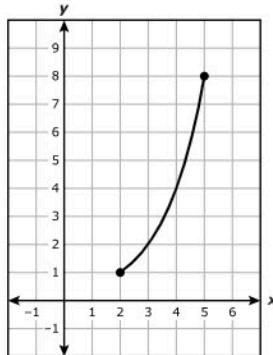
**A.9 Exponential functions and equations.** The student applies the mathematical process standards when using properties of exponential functions and their related transformations to write, graph, and represent in multiple ways exponential equations and evaluate, with and without technology, the reasonableness of their solutions. The student formulates statistical relationships and evaluates their reasonableness based on real-world data.

Connected Knowledge and Skills A.12

**A.9(A)** determine the domain and range of exponential functions of the form  $f(x) = ab^x$  and represent the domain and range using inequalities

2024 – Q17

A part of an exponential function is graphed on the grid.



Which statements are true about the domain and range of the part of the function shown?

Select **TWO** correct answers.

- The domain is the set of all real numbers greater than or equal to 1 and less than or equal to 8.
- The domain is the set of all real numbers greater than or equal to 2 and less than or equal to 5.
- The domain is the set of all real numbers.
- The range is the set of all real numbers greater than or equal to 1 and less than or equal to 8.
- The range is the set of all real numbers greater than or equal to 2 and less than or equal to 5.
- The range is the set of all real numbers.

\*Correct Answer (B , D)

#### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Describing Exponential Functions
Content	Supporting
Process	
Item Type	Multiselect (2 pts)
Stimulus	

#### Data Analysis

Item	State	Local
Full Credit	49	
No Credit	23	
Partial Credit	28	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.9(A)** determine the domain and range of exponential functions of the form  $f(x) = ab^x$  and represent the domain and range using inequalities

### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Describing Exponential Functions
<b>Content</b>	Supporting
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

! 2023 – Q18

Which statement about  $p(x) = -7(4)^x$  is true?

- (A) The domain is all real numbers greater than or equal to 4.
- (B) The range is all real numbers less than 0.
- (C) The domain is all real numbers less than or equal to 0.
- (D) The range is all real numbers.

### Data Analysis

Item	State	Local
A	23	
B*	33	
C	27	
D	17	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

\*Correct Answer (B)

## IQ Analysis | Investigating the Question

A.9(B)

RC 5

<b>A.9(B)</b> interpret the meaning of the values of a and b in exponential functions of the form $f(x) = ab^x$ in real-world problems	<b>Analysis of Assessed Standards</b>		
	<b>Cluster</b>	Exponential Functions	
2025 – Q49	<b>Subcluster</b>	Describing Exponential Functions	
The population of a town can be modeled by the exponential function $P(t) = 26,080(0.85)^t$ , where $t$ represents the number of years since 2010.	<b>Content</b>	Supporting	
Choose the correct answer from each drop-down menu to complete the sentences.	<b>Process</b>		
The initial population of the town in 2010 was <input type="text"/> .	<b>Item Type</b>	Inline Choice (2 pts)	
The population is <input type="text"/> at a rate of <input type="text"/> per year.	<b>Stimulus</b>		
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
	Full Credit	25	
	No Credit	39	
	Partial Credit	36	
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (26,080; decreasing; 15%)

**A.9(B)** interpret the meaning of the values of a and b in exponential functions of the form  $f(x) = ab^x$  in real-world problems

2024 – Q5

An investor deposited money into an investment account that earns interest compounded annually. The function shown models the amount of money in the account in dollars after  $t$  years.

$$A(t) = 1,550(1.02)^t$$

Which statement best interprets one value in the function?

A The initial deposit in the investment account was \$1,581.

B The amount of money in the investment account increases 102% each year.

C The initial deposit in the investment account was \$1,550.

D The amount of money in the investment account decreases 2% each year.

\*Correct Answer (C)

### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Describing Exponential Functions
Content	Supporting
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A		
B		
C*	61	
D		

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.9(B)** interpret the meaning of the values of a and b in exponential functions of the form  $f(x) = ab^x$  in real-world problems

! 2023 – Q27

The function  $w(t) = 270(1.029)^t$  can be used to estimate the number of whales in the North Atlantic Ocean at the end of  $t$  years. What does 1.029 represent in this function?

- (A) The initial number of whales in the North Atlantic Ocean
- (B) The decay factor of the number of whales in the North Atlantic Ocean
- (C) The number of whales in the North Atlantic Ocean at the end of the first year
- (D) The growth factor of the number of whales in the North Atlantic Ocean

#### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Describing Exponential Functions
<b>Content</b>	Supporting
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
A	10	
B	14	
C	19	
D*	57	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (D)

**A.9(B)** interpret the meaning of the values of a and b in exponential functions of the form  $f(x) = ab^x$  in real-world problems

2022 – Q36

**36** An insect population after  $x$  months can be modeled by the function  $g(x) = 18(1.3)^x$ . Which statement is the best interpretation of one of the values in this function?

- F The insect population increased by 13 insects each month.
- G The insect population decreased by 13 insects each month.
- H The insect population increased at a rate of 30% each month.
- J The insect population decreased at a rate of 30% each month.

#### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Describing Exponential Functions
<b>Content</b>	Supporting
<b>Process</b>	
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
F	22	
G	10	
H*	61	
J	7	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (H)



**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

2025 – Q18

The table represents some points on the graph of an exponential function.

x	P(x)
-1	270
0	90
1	30
2	10

Which function represents the relation shown in the table?

(A)  $P(x) = 30\left(\frac{1}{3}\right)^x$

(B)  $P(x) = 90(3)^x$

(C)  $P(x) = 90\left(\frac{1}{3}\right)^x$

(D)  $P(x) = 30(3)^x$

\*Correct Answer (C)

#### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Writing Exponential Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C*	65	
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

2025 – Q47

A bank customer opened a money market account with \$2,500. Each year the bank will add interest to the account, which will increase the account's value by 0.5%.

Which function can be used to determine the amount, A, in the account after  $t$  years?

A  $A(t) = 2,500(0.50)^t$

B  $A(t) = 2,500(1.005)^t$

C  $A(t) = 2,500 + 0.50t$

D  $A(t) = 2,500(1.005)t$

#### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Writing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
A		
B*	41	
C		
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (B)

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

2024 – Q19

The table represents some points on the graph of an exponential function.

x	$g(x)$
1	48
2	72
3	108
4	162

Which function represents the relation shown in the table?

(A)  $g(x) = 32\left(\frac{2}{3}\right)^x$

(B)  $g(x) = 48\left(\frac{2}{3}\right)^x$

(C)  $g(x) = 32\left(\frac{3}{2}\right)^x$

(D)  $g(x) = 48\left(\frac{3}{2}\right)^x$

\*Correct Answer (C)

#### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Writing Exponential Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
A		
B		
C*	59	
D		

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

! 2024 – Q43

A company currently has 500 employees. The number of employees is expected to grow at a rate of 2% each year.

Write an exponential function to model the number of employees in the company,  $y$ , after  $x$  years.

Enter your answer in the box provided.

$y =$

<input type="button" value="←"/>	<input type="button" value="→"/>	<input type="button" value="↶"/>	<input type="button" value="↷"/>	<input type="button" value="✖"/>			
1	2	3	$x$	$y$			
4	5	6	+	-	•	÷	
7	8	9	<	≤	=	≥	>
	0		$\square^0$	$\square_0$	( )	$\sqrt{\square}$	$\pi$
.	-	$\frac{\square}{\square}$					

\*Correct Answer (500(1.02) $x$ )

### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Writing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Equation Editor (1 pt)
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
Full Credit	20	
No Credit	80	

### Error Analysis

- Guessing     Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

! 2023 – Q14

Researchers studied the population of a town over time and modeled the data using an exponential function.

- The initial estimated population was 48,000.
- After the first year, the population of the town was 50,400.

If the population of the town continues to grow at this rate each year, which function can be used to model the population  $x$  years after the researchers began their study?

Ⓐ  $p(x) = 48,000 \left(\frac{50,400}{48,000}\right)^x$

Ⓑ  $p(x) = 50,400 \left(\frac{50,400}{48,000}\right)^x$

Ⓒ  $p(x) = 50,400 \left(\frac{1}{48,000}\right)^x$

Ⓓ  $p(x) = 48,000 \left(\frac{1}{50,400}\right)^x$

**Analysis of Assessed Standards**

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Writing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

**Data Analysis**

Item	State	Local
A*	37	
B	16	
C	14	
D	32	

**Error Analysis**

- Guessing     Mixed Up Concepts  
 Careless Error     Stopped Too Early

**Learning from Mistakes**  
**Instructional Implications**

\*Correct Answer (A)

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

2023 – Q36

This year the number of students who participated in sports was 317. Each year the number of students who participate in sports increases by 4%.

Which function can be used to model the number of students participating in sports after  $x$  years?

(A)  $f(x) = 317(4)^x$

(B)  $f(x) = 4x + 317$

(C)  $f(x) = 317(1.04)^x$

(D)  $f(x) = 1.04x + 317$

#### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Writing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Item Type</b>	Multiple Choice (1 pt)
<b>Stimulus</b>	

#### Data Analysis

Item	State	Local
A	30	
B	13	
C*	50	
D	6	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (C)

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Writing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

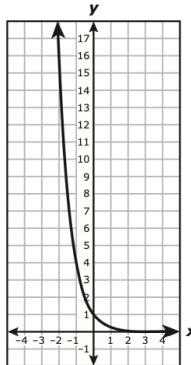
### Data Analysis

Item	State	Local
A*	68	
B	14	
C	15	
D	3	

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications



Which function is best represented by the graph?

- A**  $p(x) = (0.25)^x$
- B**  $p(x) = 2(0.5)^x$
- C**  $p(x) = (1.25)^x$
- D**  $p(x) = (25)^x$

\*Correct Answer (A)

**A.9(C)** write exponential functions in the form  $f(x) = ab^x$  (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay

2022 – Q26

- 26** The table shows the value in dollars of a motorcycle at the end of  $x$  years.

Motorcycle

Number of Years, $x$	0	1	2	3
Value, $v(x)$ (dollars)	9,000	8,100	7,290	6,561

Which exponential function models this situation?

- F**  $v(x) = 9,000(1.1)^x$
- G**  $v(x) = 9,000(0.9)^x$
- H**  $v(x) = 8,100(1.1)^x$
- J**  $v(x) = 8,100(0.9)^x$

\*Correct Answer (G)

#### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Writing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

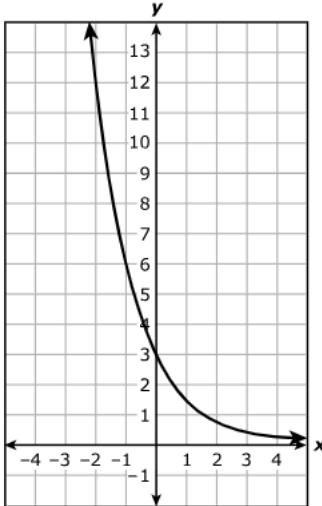
#### Data Analysis

Item	State	Local
F	12	
G*	65	
H	14	
J	8	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

<b>A.9(D)</b> graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems		<b>Analysis of Assessed Standards</b>	
2025 – Q2		<b>Cluster</b>	Exponential Functions
The graph of an exponential function is shown on the grid.		<b>Subcluster</b>	Describing Exponential Functions
		<b>Content</b>	Readiness
		<b>Process</b>	
		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>	<b>Local</b>
A			
B			
C			
D*	79		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing <input type="checkbox"/> Mixed Up Concepts <input type="checkbox"/> Careless Error <input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

Which statement is best represented by the graph of the function?

- A The equation of the asymptote of the graph is  $x = 4$ .
- B The function is increasing on the interval  $x > 0$  and decreasing on the interval  $x < 0$ .
- C The  $x$ -intercept of the graph of the function is  $(8, 0)$ .
- D The  $y$ -intercept of the graph of the function is  $(0, 3)$ .

\*Correct Answer (D)

**A.9(D)** graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems

! 2025 – Q33

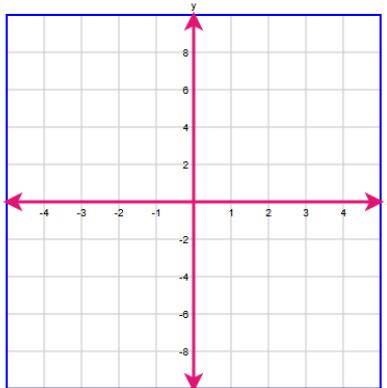
Graph the function  $f(x) = 6\left(\frac{1}{3}\right)^x$ .

Select the type of graph. Drag the two points and the asymptote, if applicable, to their correct positions.

Linear

Quadratic

Exponential



#### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Describing Exponential Functions
Content	Readiness
Process	
Item Type	Graphing (1 pt)
Stimulus	

#### Data Analysis

Item	State	Local
Full Credit	34	
No Credit	66	

#### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

\*Correct Answer (Exponential curve going through (0, 6) and (1, 2) with an asymptote of y = 0)

<b>A.9(D)</b> graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems	<b>Analysis of Assessed Standards</b>			
2024 – Q11		<b>Cluster</b>	Exponential Functions	
		<b>Subcluster</b>	Describing Exponential Functions	
		<b>Content</b>	Readiness	
		<b>Process</b>		
		<b>Item Type</b>	Multiple Choice (1 pt)	
		<b>Stimulus</b>		
<p>Which statement about the graph of <math>y = 16(0.5)^x</math> is <b>NOT</b> true?</p> <ul style="list-style-type: none"> <li>(A) The <math>y</math>-intercept is <math>(0, 16)</math>.</li> <li>(B) The graph is decreasing for all values of <math>x</math>.</li> <li>(C) The <math>x</math>-intercept is <math>(0.5, 0)</math>.</li> <li>(D) The graph has a horizontal asymptote at <math>y = 0</math>.</li> </ul>		<b>Data Analysis</b>		
		<b>Item</b>	<b>State</b>	<b>Local</b>
		A		
		B		
		C*	53	
		D		
		<b>Error Analysis</b>		
		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
		<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
		<b>Learning from Mistakes</b> <b>Instructional Implications</b>		
		<span style="font-size: small;">*Correct Answer (C)</span>		

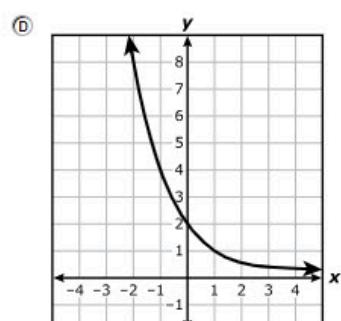
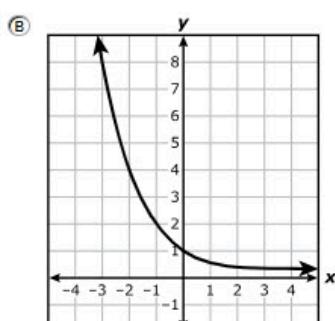
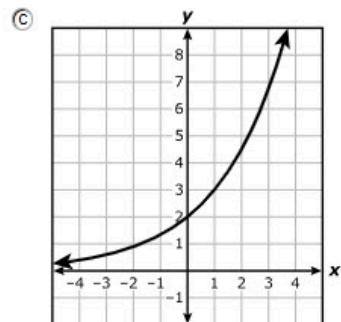
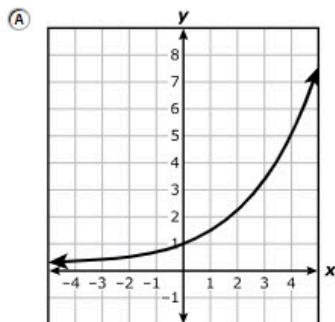
**A.9(D)** graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems

2024 – Q27

An exponential function has these characteristics:

- The  $y$ -intercept is 2.
- The function increases at a rate of 50%.

Which graph best represents this function?



\*Correct Answer (C)

### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Describing Exponential Functions
Content	Readiness
Process	
Item Type	Multiple Choice (1 pt)
Stimulus	

### Data Analysis

Item	State	Local
A		
B		
C*	74	
D		

### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

<b>A.9(D)</b> graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems	<b>Analysis of Assessed Standards</b>			
2023 – Q9	<b>Cluster</b>	Exponential Functions		
What is the equation of the asymptote of the graph of the function $y = 16(0.75)^x$ ?	<b>Subcluster</b>	Describing Exponential Functions		
Move the correct answer to each box. Not all answers will be used.	<b>Content</b>	Readiness		
<input type="text" value="x"/> <input type="text" value="y"/> <input type="text" value="0"/> <input type="text" value="0.75"/> <input type="text" value="12"/> <input type="text" value="16"/>	<b>Process</b>			
<input type="text"/> = <input type="text"/>	<b>Item Type</b>	Drag and Drop (2 pts)		
	<b>Stimulus</b>			
	<b>Data Analysis</b>			
	<b>Item</b>	<b>State</b>		
	Full Credit	14		
	No Credit	27		
	Partial Credit	59		
<b>Error Analysis</b>				
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts			
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early			
<b>Learning from Mistakes</b>				
<b>Instructional Implications</b>				
*Correct Answer (y, 0)				

<p><b>A.9(D)</b> graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems</p> <p>2023 – Q42</p> <p>A customer purchases an electronic device for \$650. Each year the value of the electronic device decreases by 30%. Which statement is true about the graph that represents the relationship between the value of the device in dollars, <math>y</math>, and the number of years, <math>x</math>, since the device was purchased?</p> <p>(A) The <math>y</math>-intercept of the graph is 650.</p> <p>(B) The <math>y</math>-intercept of the graph is 455.</p> <p>(C) The graph has a vertical asymptote at <math>x = 0</math>.</p> <p>(D) The graph has a horizontal asymptote at <math>y = 30</math>.</p>	<b>Analysis of Assessed Standards</b>	
<b>Cluster</b>	Exponential Functions	
<b>Subcluster</b>	Describing Exponential Functions	
<b>Content</b>	Readiness	
<b>Process</b>		
<b>Item Type</b>	Multiple Choice (1 pt)	
<b>Stimulus</b>		
<b>Data Analysis</b>		
<b>Item</b>	<b>State</b>	<b>Local</b>
A*	55	
B	14	
C	13	
D	17	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b>		
<b>Instructional Implications</b>		

\*Correct Answer (A)

<p><b>A.9(D)</b> graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems</p> <p>2022 – Q20</p> <p><b>20</b> What is the value of the <math>y</math>-intercept of the graph of <math>h(x) = 12.3(4.9)^x</math>?</p> <p>Record your answer and fill in the bubbles on your answer document.</p>	<b>Analysis of Assessed Standards</b>	
<b>Cluster</b>	Exponential Functions	
<b>Subcluster</b>	Describing Exponential Functions	
<b>Content</b>	Readiness	
<b>Process</b>		
<b>Stimulus</b>		
<b>Data Analysis</b>		
<b>Item</b>	<b>State</b>	<b>Local</b>
12.3	50*	
	49	
<b>Error Analysis</b>		
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early	
<b>Learning from Mistakes</b>		
<b>Instructional Implications</b>		

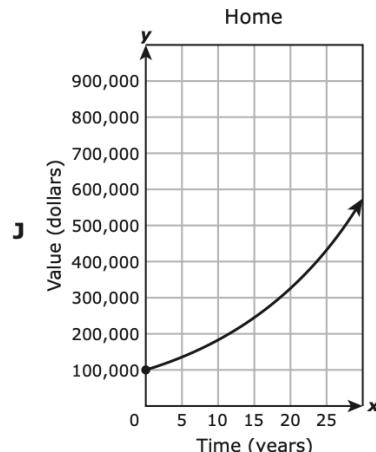
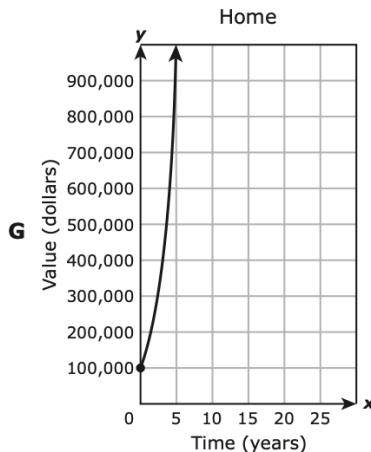
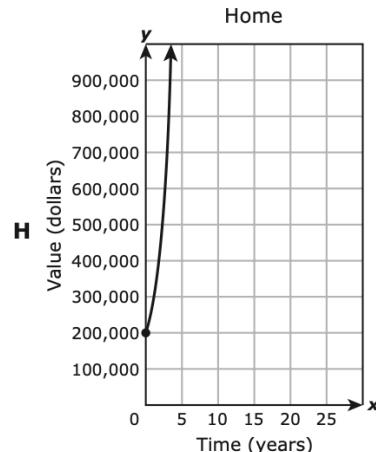
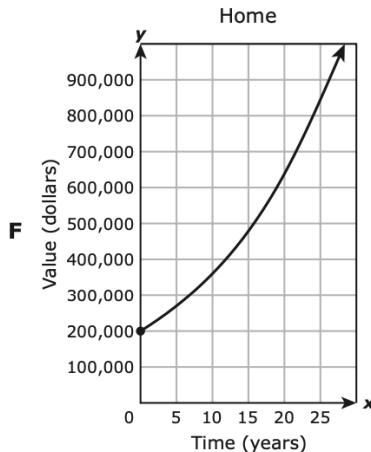
\*Correct Answer (12.3)

**A.9(D)** graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems

2022 – Q52

- 52** The initial value of a home is \$200,000. The value of the home will increase at a rate of 6% each year.

Which graph best models this situation?



\*Correct Answer (F)

### Analysis of Assessed Standards

<b>Cluster</b>	Exponential Functions
<b>Subcluster</b>	Describing Exponential Functions
<b>Content</b>	Readiness
<b>Process</b>	
<b>Stimulus</b>	

### Data Analysis

Item	State	Local
F*	53	
G	10	
H	24	
J	13	

### Error Analysis

- Guessing       Mixed Up Concepts
- Careless Error     Stopped Too Early

### Learning from Mistakes Instructional Implications

## IQ Analysis | Investigating the Question

A.9(E)

RC 5

<b>A.9(E)</b> write, using technology, exponential functions that provide a reasonable fit to data and make predictions for real-world problems		<b>Analysis of Assessed Standards</b>															
2025 – Q43		<b>Cluster</b>	Exponential Functions														
A student drops a ball and measures the height of the ball while it is bouncing. The table shows the height of the ball in inches, $y$ , after it has bounced $x$ times.		<b>Subcluster</b>	Writing Exponential Functions														
<p style="text-align: center;"><b>Bouncing Ball</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Number of Bounces, <math>x</math></th> <th>Height of Ball, <math>y</math> (inches)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>72</td> </tr> <tr> <td>1</td> <td>43.2</td> </tr> <tr> <td>2</td> <td>25.9</td> </tr> <tr> <td>3</td> <td>15.6</td> </tr> <tr> <td>4</td> <td>9.3</td> </tr> </tbody> </table>		Number of Bounces, $x$	Height of Ball, $y$ (inches)	0	72	1	43.2	2	25.9	3	15.6	4	9.3	<b>Content</b>	Supporting		
Number of Bounces, $x$	Height of Ball, $y$ (inches)																
0	72																
1	43.2																
2	25.9																
3	15.6																
4	9.3																
		<b>Process</b>															
		<b>Item Type</b>	Multiple Choice (1 pt)														
		<b>Stimulus</b>															
<b>Data Analysis</b>																	
<b>Item</b>	<b>State</b>	<b>Local</b>															
A*	61																
B																	
C																	
D																	
<b>Error Analysis</b>																	
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts																
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early																
<b>Learning from Mistakes</b>																	
<b>Instructional Implications</b>																	

Which exponential function best models the data?

(A)  $y = 72(0.6)^x$

(B)  $y = 43.2(0.6)^x$

(C)  $y = 72(0.4)^x$

(D)  $y = 43.2(0.4)^x$

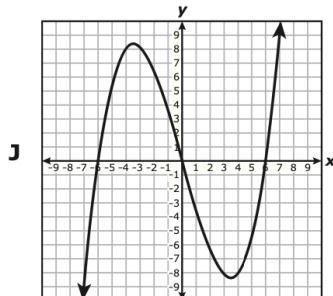
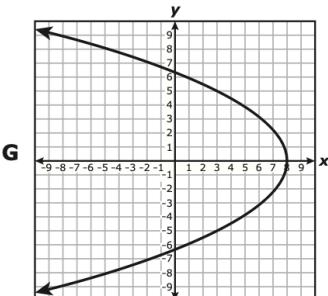
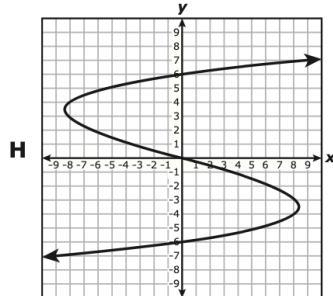
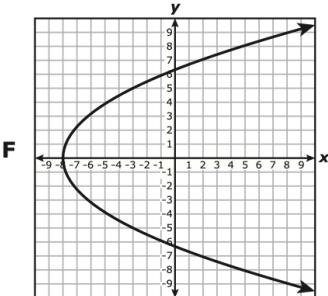
**\*Correct Answer (A)**

<b>A.9(E)</b> write, using technology, exponential functions that provide a reasonable fit to data and make predictions for real-world problems	<b>Analysis of Assessed Standards</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;">Cluster</td><td>Exponential Functions</td></tr> <tr><td>Subcluster</td><td>Writing Exponential Functions</td></tr> <tr><td>Content</td><td>Supporting</td></tr> <tr><td>Process</td><td></td></tr> <tr><td>Stimulus</td><td></td></tr> </table> <b>Data Analysis</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th style="width: 15%;">Item</th><th style="width: 15%;">State</th><th style="width: 15%;">Local</th></tr> </thead> <tbody> <tr><td>F*</td><td>61</td><td></td></tr> <tr><td>G</td><td>17</td><td></td></tr> <tr><td>H</td><td>15</td><td></td></tr> <tr><td>J</td><td>7</td><td></td></tr> </tbody> </table> <b>Error Analysis</b> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;"><input type="checkbox"/> Guessing</td><td style="width: 50%;"><input type="checkbox"/> Mixed Up Concepts</td></tr> <tr><td><input type="checkbox"/> Careless Error</td><td><input type="checkbox"/> Stopped Too Early</td></tr> </table> <b>Learning from Mistakes</b> <b>Instructional Implications</b>				Cluster	Exponential Functions	Subcluster	Writing Exponential Functions	Content	Supporting	Process		Stimulus		Item	State	Local	F*	61		G	17		H	15		J	7		<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts	<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early
Cluster	Exponential Functions																																
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Item	State	Local																															
F*	61																																
G	17																																
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J	7																																
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts																																
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early																																
2022 – Q44	<p><b>44</b> The table shows the net revenue in millions of dollars of a company every three months for two years. An exponential function can be used to model the data.</p> <p style="text-align: center;"><b>Company</b></p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr><th style="text-align: left;">Time, <math>x</math> (months)</th><th style="text-align: left;">Net Revenue, <math>r(x)</math> (millions of dollars)</th></tr> </thead> <tbody> <tr><td>3</td><td>274</td></tr> <tr><td>6</td><td>389</td></tr> <tr><td>9</td><td>467</td></tr> <tr><td>12</td><td>560</td></tr> <tr><td>15</td><td>960</td></tr> <tr><td>18</td><td>1,100</td></tr> <tr><td>21</td><td>1,320</td></tr> <tr><td>24</td><td>1,584</td></tr> </tbody> </table> <p>Which function best models the data?</p> <p><b>F</b> <math>r(x) = 223.06(1.09)^x</math></p> <p><b>G</b> <math>r(x) = 1.09(223.06)^x</math></p> <p><b>H</b> <math>r(x) = 2,232.91(0.92)^x</math></p> <p><b>J</b> <math>r(x) = 0.92(2,232.91)^x</math></p> <p>*Correct Answer (F)</p>				Time, $x$ (months)	Net Revenue, $r(x)$ (millions of dollars)	3	274	6	389	9	467	12	560	15	960	18	1,100	21	1,320	24	1,584											
Time, $x$ (months)	Net Revenue, $r(x)$ (millions of dollars)																																
3	274																																
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12	560																																
15	960																																
18	1,100																																
21	1,320																																
24	1,584																																

**A.12(A)** decide whether relations represented verbally, tabularly, graphically, and symbolically define a function

2022 – Q4

- 4 Which graph represents  $y$  as a function of  $x$ ?



\*Correct Answer (J)

#### Analysis of Assessed Standards

Cluster	Exponential Functions
Subcluster	Describing Exponential Functions
Content	Supporting
Process	
Stimulus	

#### Data Analysis

Item	State	Local
F	23	
G	17	
H	9	
J*	52	

#### Error Analysis

- Guessing       Mixed Up Concepts  
 Careless Error     Stopped Too Early

#### Learning from Mistakes Instructional Implications

## IQ Analysis | Investigating the Question

A.12(C)

RC 1

<b>A.12(C)</b> identify terms of arithmetic and geometric sequences when the sequences are given in function form using recursive processes		<b>Analysis of Assessed Standards</b>	
2025 – Q40		<b>Cluster</b>	Exponential Functions
A sequence can be generated by using the equation shown, where $a_1 = 100$ and $n$ is a whole number greater than 1.		<b>Subcluster</b>	Writing Exponential Functions
$a_n = 1.1a_{(n-1)}$		<b>Content</b>	Supporting
What are the first four terms in the sequence?		<b>Process</b>	
<p>(A) 100    210    441    926.1</p> <p>(B) 100    109    118.9    129.79</p> <p>(C) 100    101.1    102.2    103.3</p> <p>(D) 100    110    121    133.1</p>		<b>Item Type</b>	Multiple Choice (1 pt)
		<b>Stimulus</b>	
<b>Data Analysis</b>			
Item	State	Local	
A			
B			
C			
D*	29		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			

\*Correct Answer (D)

## IQ Analysis | Investigating the Question

## A.12(D)

## RC 1

<b>A.12(D)</b> write a formula for the nth term of arithmetic and geometric sequences, given the value of several of their terms	<b>Analysis of Assessed Standards</b>		
2022 – Q41	<b>Cluster</b>	Exponential Functions	
<b>41</b> The first six terms in a geometric sequence are shown, where $a_1 = -4$ .  -4    -16    -64    -256    -1,024    -4,096 . . .	<b>Subcluster</b>	Writing Exponential Functions	
Based on this information, which equation can be used to find the $n^{\text{th}}$ term in the sequence, $a_n$ ?	<b>Content</b>	Supporting	
<b>A</b> $a_n = -4n$	<b>Process</b>		
<b>B</b> $a_n = -(4)^n$	<b>Stimulus</b>		
<b>C</b> $a_n = -n^2$			
<b>D</b> $a_n = (-4)^n$			
<b>Data Analysis</b>			
Item	State	Local	
A	22		
B*	36		
C	14		
D	28		
<b>Error Analysis</b>			
<input type="checkbox"/> Guessing	<input type="checkbox"/> Mixed Up Concepts		
<input type="checkbox"/> Careless Error	<input type="checkbox"/> Stopped Too Early		
<b>Learning from Mistakes</b> <b>Instructional Implications</b>			
<b>*Correct Answer (B)</b>			

IQ Analysis   Investigating the Question		SE	RC																																										
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