# STAR Test Sample Questions

## 7th Grade Algebra

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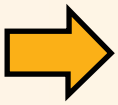

# STAR Test Sample Questions

## 7th Grade Algebra

### Quadratics and Polynomials

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# Standardized Testing and Reporting - STAR

## Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 01***

**What is $\frac{x^2 - 4xy + 4y^2}{3xy - 6y^2}$ reduced to lowest terms?**

A $\frac{x-2y}{3}$

B $\frac{x-2y}{3y}$

C $\frac{x+2y}{3}$

D $\frac{x+2y}{3y}$

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 02***

**Simplify** $\frac{6x^2+21x+9}{4x^2-1}$ **to lowest terms.**

A $\frac{3(x+1)}{2x-1}$

B $\frac{3(x+3)}{2x-1}$

C $\frac{3(2x+3)}{4(x-1)}$

D $\frac{3(x+3)}{2x+1}$

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 03***

**What is $\frac{x^2-4x+4}{x^2-3x+2}$ reduced to lowest terms?**

A $\frac{x-2}{x-1}$

B $\frac{x-2}{x+1}$

C $\frac{x+2}{x-1}$

D $\frac{x+2}{x+1}$

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 04***

$$\frac{7z^2+7z}{4z+8}\cdot\frac{z^2-4}{z^3+2z^2+z}=$$

A $\frac{7(z-2)}{4(z+1)}$

B $\frac{7(z+2)}{4(z-1)}$

C $\frac{7z(z+1)}{4(z+2)}$

D $\frac{7z(z-1)}{4(z+2)}$

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 05***

**Which fraction equals the product** $\left(\frac{x+5}{3x+2}\right)\left(\frac{2x-3}{x-5}\right)$**?**

A $\frac{2x-3}{3x+2}$

B $\frac{3x+2}{4x-3}$

C $\frac{x^2-25}{6x^2-5x-6}$

D $\frac{2x^2+7x-15}{3x^2-13x-10}$

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 06***

$$\frac{x^2+8x+16}{x+3} \div \frac{2x+8}{x^2-9} =$$

A $\dfrac{2(x+4)^2}{(x-3)(x+3)^2}$

B $\dfrac{2(x+3)(x-3)}{x+4}$

C $\dfrac{(x+4)(x-3)}{2}$

D $\dfrac{(x+4)(x-3)^2}{2(x+3)}$

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 07***

**Which relation is a function?**

A {(–1, 3), (–2, 6), (0, 0), (–2, –2)}

B {(–2, –2), (0, 0), (1, 1), (2, 2)}

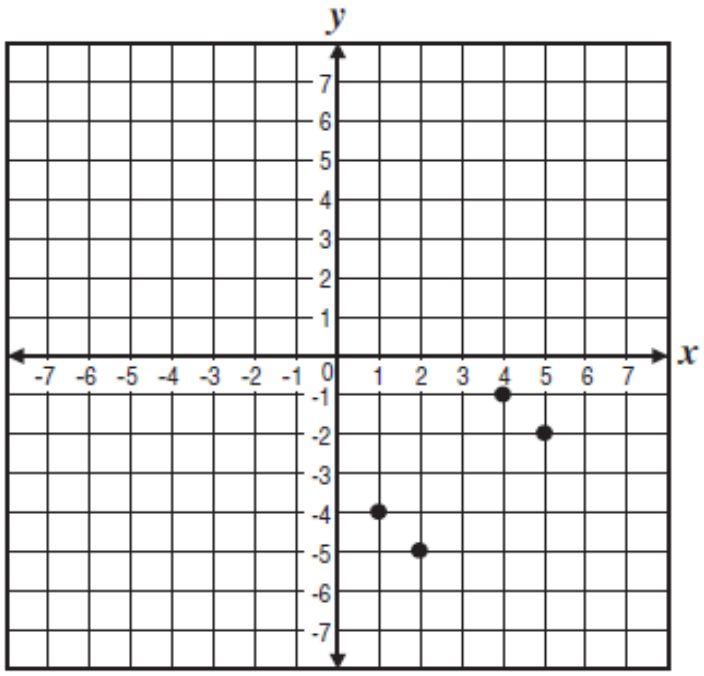
C {(4, 0), (4, 1), (4, 2), (4, 3)}

D {(7, 4), (8, 8), (10, 8), (10, 10)}

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Advanced) – Question 08***

**What is the domain of the function shown on the graph below?**




A {-1, -2, -3, -4}

B {-1, -2, -4, -5}

C {1, 2, 3, 4}

D {1, 2, 4, 5}

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Proficient) – Question 01***

Andy's average driving speed for a 4-hour trip was 45 miles per hour. During the first 3 hours he drove 40 miles per hour.

**What was his average speed for the last hour of his trip?**

A 50 miles per hour

B 60 miles per hour

C 65 miles per hour

D 70 miles per hour

# Grade 7 - Algebra I (End-of-course)

***Functions and Rational Expressions (Performance Level: Proficient) – Question 02***

Two airplanes left the same airport traveling in opposite directions. If one airplane averages 400 miles per hour and the other airplane averages 250 miles per hour, **in how many hours will the distance between the two planes be 1625 miles?**

A 2.5

B 4

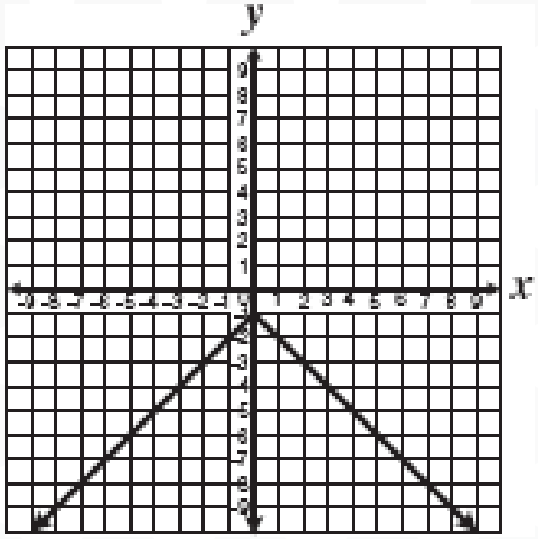
C 5

D 10.8

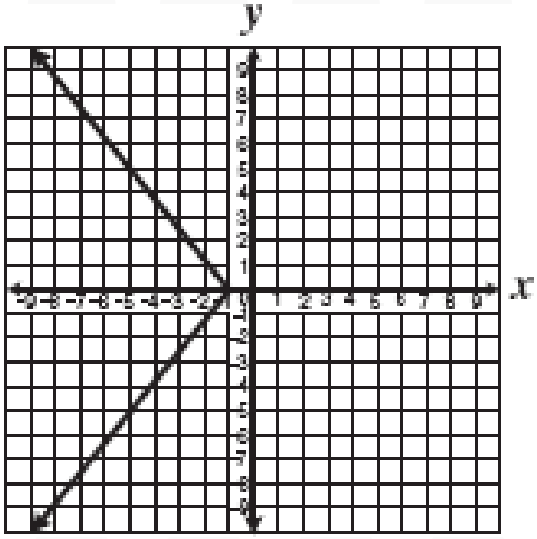
# Grade 7 - Algebra I (End-of-course)

*Functions and Rational Expressions (Performance Level: Basic) – Question 01*

**For which equation graphed below are all the y-values negative?**




A

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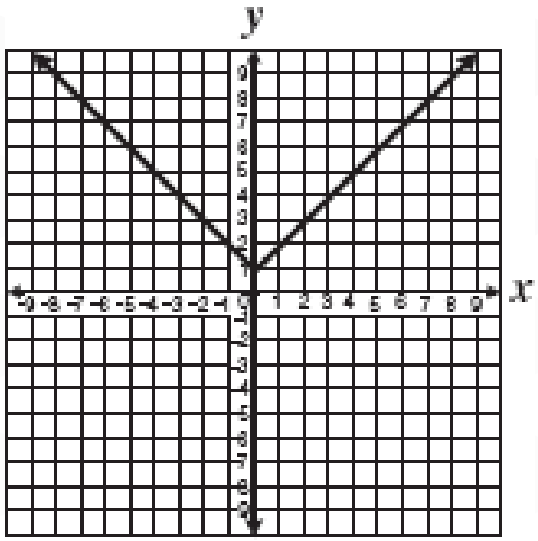
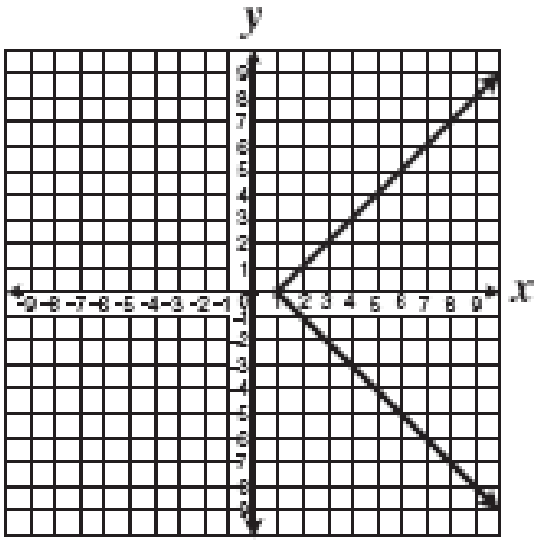



B

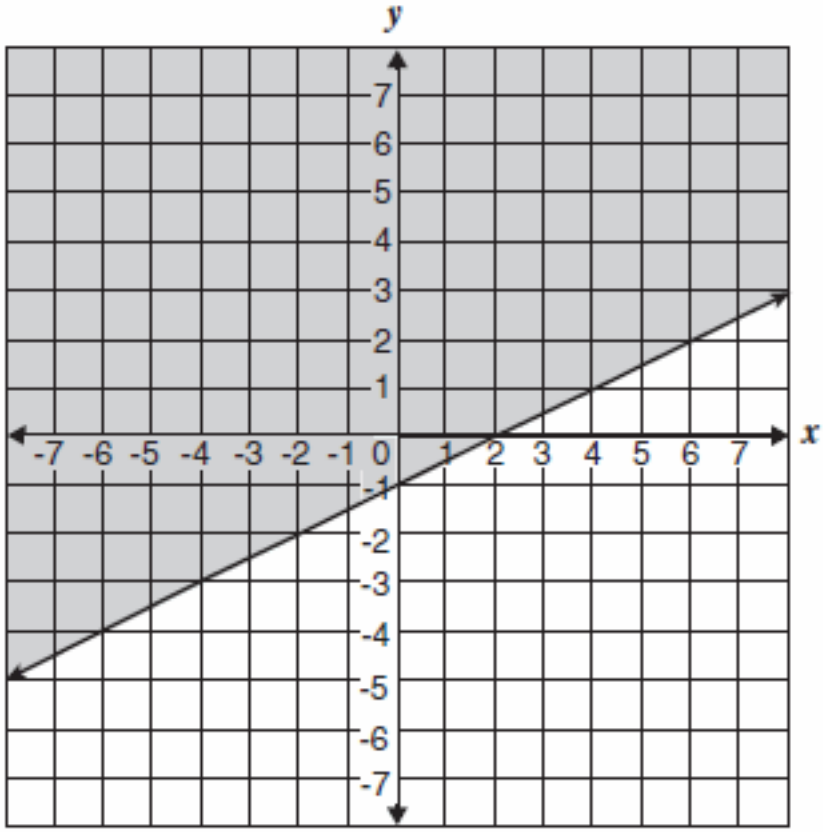



D

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Advanced) – Question 01***

**Which inequality is shown on the graph below?**




A $y < \frac{1}{2}x - 1$

B $y \leq \frac{1}{2}x - 1$

C $y > \frac{1}{2}x - 1$

D $y \geq \frac{1}{2}x - 1$

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Advanced) – Question 02***

**Which point lies on the line defined by $3x + 6y = 2$?**

A (0, 2)

B (0, 6)

C $\left(1, -\frac{1}{6}\right)$

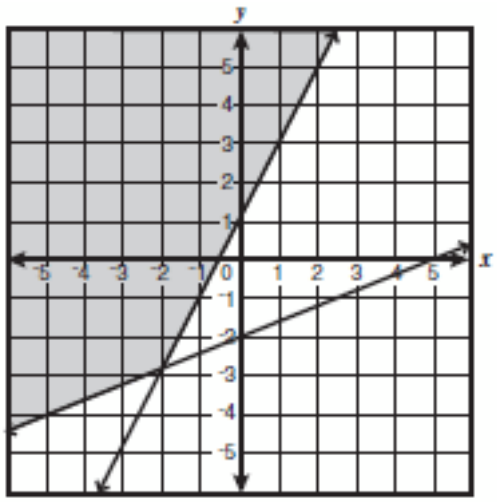
D $\left(1, -\frac{1}{3}\right)$

# Grade 7 - Algebra I (End-of-course)

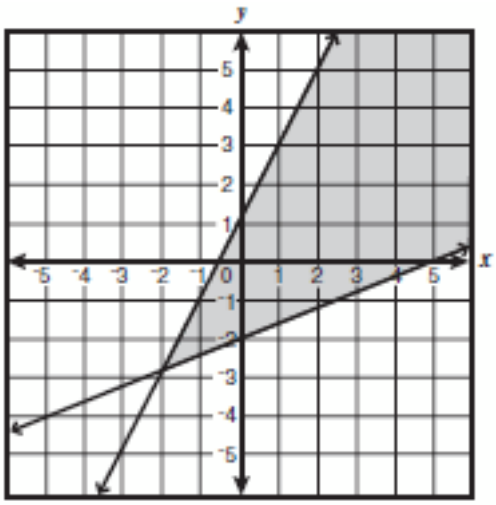
***Graphing and Systems of Linear Equations (Performance Level: Advanced) – Question 03***

**Which graph best represents the solution to this system of inequalities?**

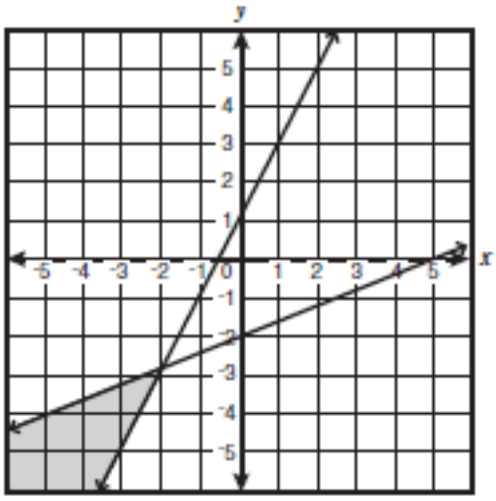
$$\begin{cases} 2x \geq y - 1 \\ 2x - 5y \leq 10 \end{cases}$$



A



C



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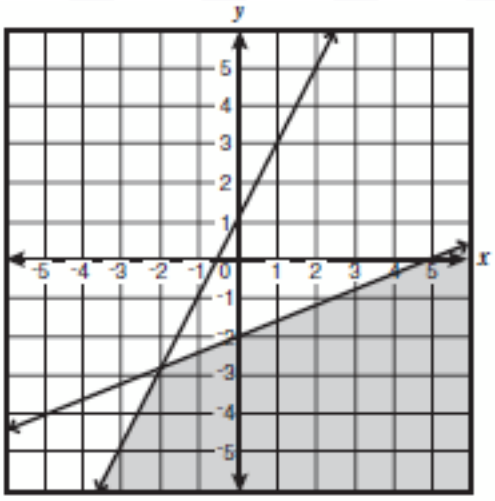


D

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Proficient) – Question 01***

The data in the table show the cost of renting a bicycle by the hour, including a deposit.

**Renting a Bicycle**

| Hours ($h$) | Cost in dollars ($c$) |
|---|---|
| 2 | 15 |
| 5 | 30 |
| 8 | 45 |

If hours, h, were graphed on the horizontal axis and cost, c, were graphed on the vertical axis, **what would be the equation of a line that fits the data?**

A $c = 5h$

B $c = \frac{1}{5}h + 5$

C $c = 5h + 5$

D $c = 5h - 5$

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Proficient) – Question 02***

**What is the equation of the line that has a slope of 4 and passes through the point (3, -10)?**

A $y = 4x - 22$

B $y = 4x + 22$

C $y = 4x - 43$

D $y = 4x + 43$

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Proficient) – Question 03***

The equation of line l is $6x + 5y = 3$, and the equation of line q is $5x - 6y = 0$.

**Which statement about the two lines is true?**

A Lines l and q have the same y-intercept.

B Lines l and q are parallel.

C Lines l and q have the same x-intercept.

D Lines l and q are perpendicular.

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Proficient) – Question 04***

**Which equation represents a line that is parallel to $y = -\frac{5}{4}x + 2$?**

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

B $y = -\frac{4}{5}x + 2$

C $y = \frac{4}{5}x + 3$

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

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Proficient) – Question 05***

**Which ordered pair is the solution to the system of equations below?**

$$\begin{cases} x+3y=7 \\ x+2y=10 \end{cases}$$

A $\left(\frac{7}{2}, \frac{13}{4}\right)$

B $\left(\frac{7}{2}, \frac{17}{5}\right)$

C (–2, 3)

D (16, –3)

# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Proficient) – Question 06***

Marcy has a total of 100 dimes and quarters. If the total value of the coins is $14.05, **how many quarters does she have?**

A 27

B 40

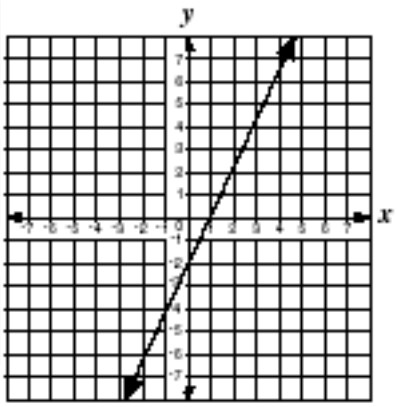
C 56

D 73

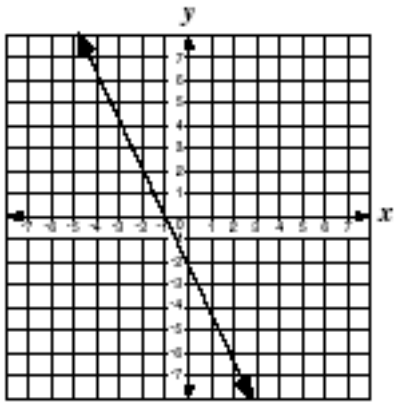
# Grade 7 - Algebra I (End-of-course)

***Graphing and Systems of Linear Equations (Performance Level: Basic) – Question 01***

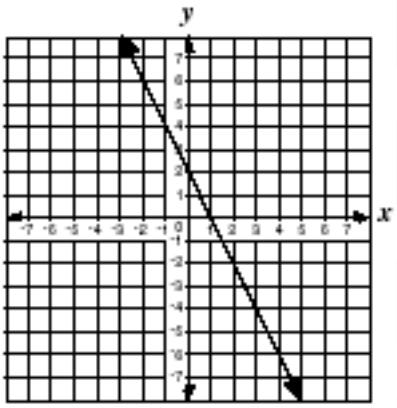
**Which best represents the graph of $y = 2x - 2$?**



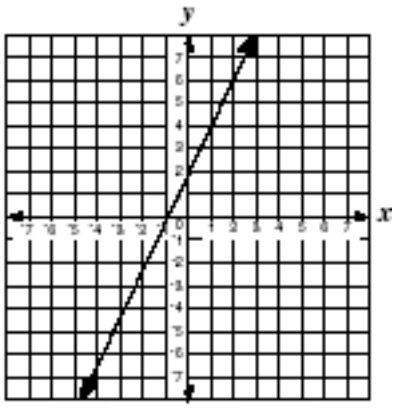

A




C




B




D

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Advanced) – Question 01***

$$\sqrt{16} + \sqrt[3]{8} =$$

A 4

B 6

C 9

D 10

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Advanced) – Question 02***

**What is the solution for this equation?**

$$|2x-3|=5$$

A $x=-4$ or $x=4$

B $x=-4$ or $x=3$

C $x=-1$ or $x=4$

D $x=-1$ or $x=3$

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Advanced) – Question 03***

John's solution to an equation is shown below.

$$\begin{aligned}
&\textbf{Given:} && x^2+5x+6=0\\
&\textbf{Step 1:} && (x+2)(x+3)=0\\
&\textbf{Step 2:} && x+2=0 \text{ or } x+3=0\\
&\textbf{Step 3:} && x=-2 \text{ or } x=-3
\end{aligned}$$

**Which property of real numbers did John use for Step 2?**

A multiplication property of equality

B zero product property of multiplication

C commutative property of multiplication

D distributive property of multiplication over addition

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Proficient) – Question 01***

**Which equation is equivalent to $5x - 2(7x + 1) = 14x$?**

A $-9x - 2 = 14x$

B $-9x + 1 = 14x$

C $-9x + 2 = 14x$

D $12x - 1 = 14x$

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Proficient) – Question 02***

The chart below shows an expression evaluated for four different values of x.

| $x$ | $x^2+x+5$ |
|---|---|
| 1 | 7 |
| 2 | 11 |
| 6 | 47 |
| 7 | 61 |

Josiah concluded that for all positive values of $x$, $x^2+x+5$ produces a prime number.

**Which value of x serves as a counterexample to prove Josiah's conclusion false?**

A 5

B 11

C 16

D 21

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 01***

**Is the equation $3(2x-4)=-18$ equivalent to $6x-12=-18$?**

A Yes, the equations are equivalent by the Associative Property of Multiplication.

B Yes, the equations are equivalent by the Commutative Property of Multiplication.

C Yes, the equations are equivalent by the Distributive Property of Multiplication over Addition.

D No, the equations are not equivalent.

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 02***

**Which expression is equivalent to $x^6x^2$?**

A $x^4x^3$

B $x^5x^3$

C $x^7x^3$

D $x^9x^3$

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 03***

**Which equation is equivalent to $4(2-5x)=6-3(1-3x)$?**

A $8x=5$

B $8x=17$

C $29x=5$

D $29x=17$

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 04***

The total cost (c) in dollars of renting a sailboat for n days is given by the equation

$$c = 120 + 60n.$$

If the total cost was $360, **for how many days was the sailboat rented?**

A 2

B 4

C 6

D 8

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 05***

The cost to rent a construction crane is $750 per day plus $250 per hour of use.

**What is the maximum number of hours the crane can be used each day if the rental cost is not to exceed $2500 per day?**

A 2.5

B 3.7

C 7.0

D 13.0

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 06***

Stan's solution to an equation is shown below.

$$
\begin{aligned}
\textbf{Given:}\quad & n+8(n+20)=110 \\
\textbf{Step 1:}\quad & n+8n+20=110 \\
\textbf{Step 2:}\quad & 9n+20=110 \\
\textbf{Step 3:}\quad & 9n=110-20 \\
\textbf{Step 4:}\quad & 9n=90 \\
\textbf{Step 5:}\quad & \frac{9n}{9}=\frac{90}{9} \\
\textbf{Step 6:}\quad & n=10
\end{aligned}
$$

**Which statement about Stan's solution is true?**

A Stan's solution is correct.

B Stan made a mistake in Step 1.

C Stan made a mistake in Step 3.

D Stan made a mistake in Step 5.

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 07***

The opposite of a number is less than the original number.

**When is this statement true?**

A This statement is never true.

B This statement is always true.

C This statement is true for positive numbers.

D This statement is true for negative numbers.

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Basic) – Question 08***

**Solve:** $3(x+5)=2x+35$

**Step 1:** $3x+15=2x+35$
**Step 2:** $5x+15=35$
**Step 3:** $5x=20$
**Step 4:** $x=4$

**Which is the first incorrect step in the solution shown above?**

A Step 1

B Step 2

C Step 3

D Step 4

# Grade 7 - Algebra I (End-of-course)

***Number Properties, Operations, and Linear Equations (Performance Level: Below Basic) – Question 01***

**Which number does not have a reciprocal?**

A –1

B 0

C $\frac{1}{1000}$

D 3

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Advanced) – Question 01*

**Which is the factored form of $3a^2 - 24ab + 48b^2$ ?**

A $(3a - 16b)(a - 3b)$

B $(3a - 16b)(a - 3b)$

C $3(a - 4b)(a - 4b)$

D $3(a - 8b)(a - 8b)$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Advanced) – Question 02*

$$x^2 - 8x = 5$$

**What quantity should be added to both sides of this equation to complete the square?**

A 4

B – 4

C 16

D –16

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Advanced) – Question 03*

**What are the solutions for the quadratic equation $x^2 + 6x = 16$?**

A $-2, -8$

B $-2, 8$

C $2, -8$

D $2, 8$

# Grade 7 - Algebra I (End-of-course)

***Quadratics and Polynomials (Performance Level: Advanced) – Question 04***

Leanne correctly solved the equation $x^2 + 4x = 6$ by completing the square.

**Which equation is part of her solution?**

A $(x+2)^2 = 8$

B $(x+2)^2 = 10$

C $(x+4)^2 = 10$

D $(x+4)^2 = 22$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Advanced) – Question 05*

**Which is one of the solutions to the equation $2x^2 - x - 4 = 0$?**

A $\frac{1}{4} - \sqrt{33}$

B $-\frac{1}{4} + \sqrt{33}$

C $\frac{1 + \sqrt{33}}{4}$

D $\frac{-1 - \sqrt{33}}{4}$

# Grade 7 - Algebra I (End-of-course)

***Quadratics and Polynomials (Performance Level: Advanced) – Question 06***

**What is the solution set of the quadratic equation $8x^2 + 2x + 1 = 0$?**

A $\left\{-\frac{1}{2}, \frac{1}{4}\right\}$

B $\left\{-1+\sqrt{2}, -1-\sqrt{2}\right\}$

C $\left\{\frac{-1+\sqrt{7}}{8}, \frac{-1-\sqrt{7}}{8}\right\}$

D no real solution

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Advanced) – Question 07*

$$(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$$

A $3x^2 + x + 6$

B $3x^2 + x + 10$

C $3x^2 - 5x + 6$

D $3x^2 - 5x + 10$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Proficient) – Question 01*

Which is a factor of $x^2 - 11x + 24$?

A $x + 3$

B $x - 3$

C $x + 4$

D $x - 4$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Proficient) – Question 02*

**Which of the following shows $9t^2 + 12t + 4$ factored completely?**

A $(3t+2)^2$

B $(3t+4)(3t+1)$

C $(9t+4)(t+1)$

D $9t^2 + 12t + 4$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Proficient) – Question 03*

**If x2 is added to x, the sum is 42. Which of the following could be the value of x?**

A –7

B –6

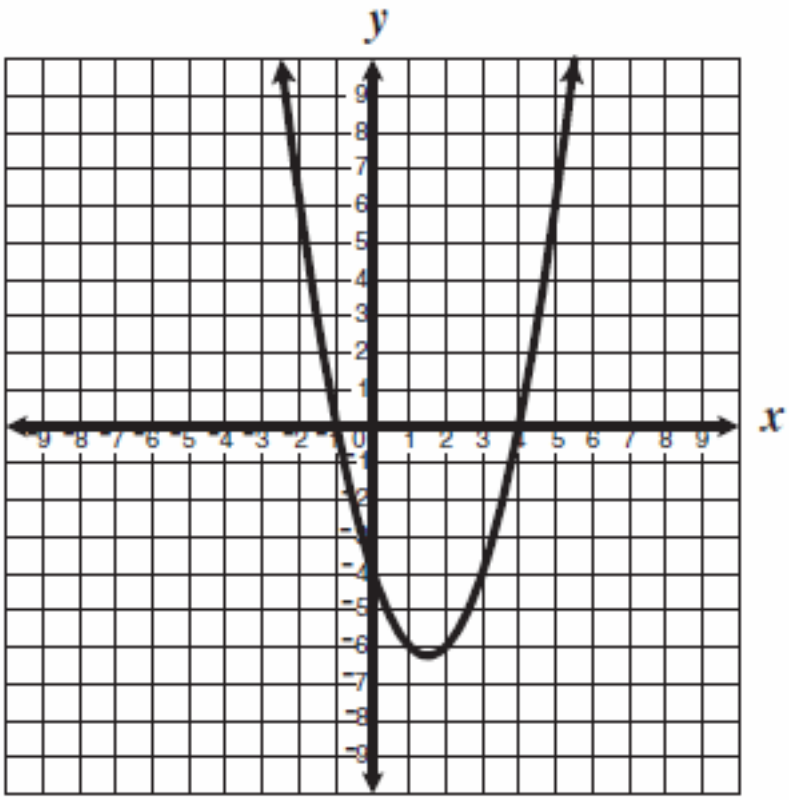
C 14

D 42

# Grade 7 - Algebra I (End-of-course)

***Quadratics and Polynomials (Performance Level: Proficient) – Question 04***

The graph of the equation $y = x^2 - 3x - 4$ is shown below.




**For what value or values of x is $y = 0$?**

A $x = -1$ only

B $x = -4$ only

C $x = -1$ and $x = 4$

D $x = 1$ and $x = -4$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Proficient) – Question 05*

**Which of the following expressions is equal to $(x+2)+(x-2)(2x+1)$?**

A $2x^2-2x$

B $2x^2-4x$

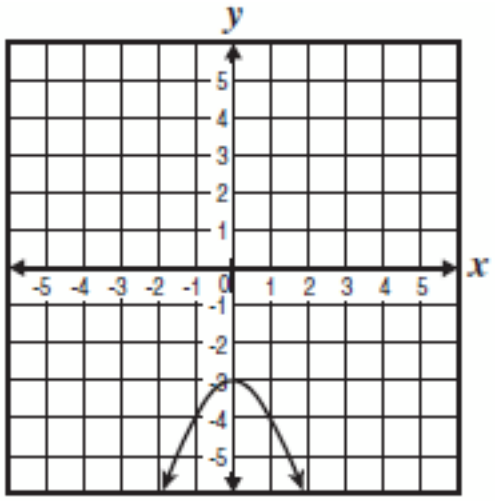
C $2x^2+x$

D $4x^2+2x$

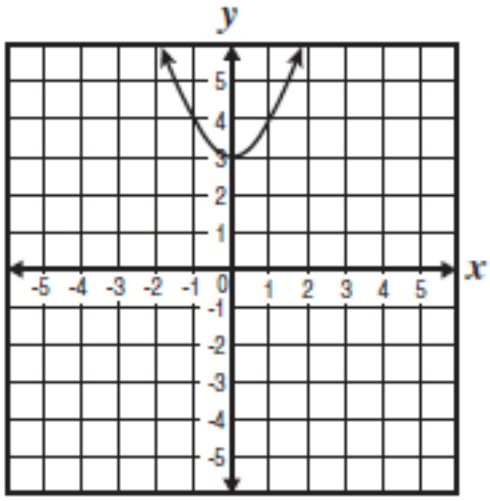
# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Basic) – Question 01*

**Which best represents the graph of $y = -x^2 + 3$?**




A

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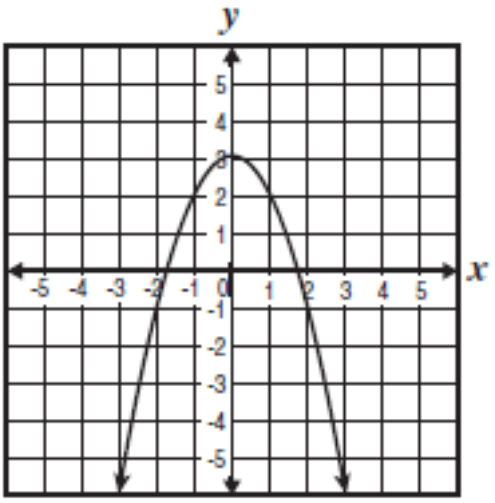


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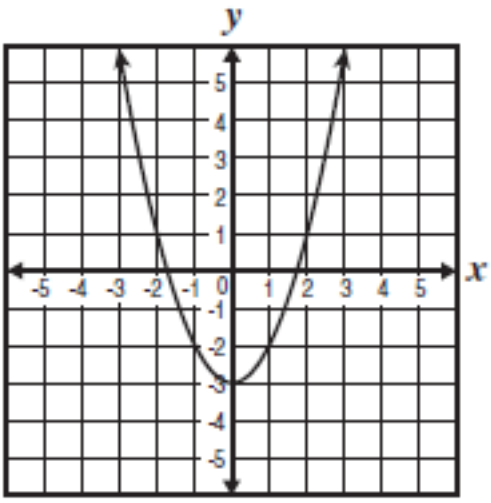


D

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Basic) – Question 02*

$$\frac{5x^3}{10x^7} =$$

A $2x^4$

B $\frac{1}{2x^4}$

C $\frac{1}{5x^4}$

D $\frac{x^4}{5}$

# Grade 7 - Algebra I (End-of-course)

*Quadratics and Polynomials (Performance Level: Basic) – Question 03*

**The sum of two binomials is $5x^2 - 6x$. If one of the binomials is $3x^2 - 2x$, what is the other binomial?**

A $2x^2 - 4x$

B $2x^2 - 8x$

C $8x^2 + 4x$

D $8x^2 - 8x$