Wisconsin WFE Grade 8 Math Practice

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Wisconsin Forward Exam

WISCONSIN DEPARTMENT OF Public Instruction

Mathematics Item Sampler Grade 8

Answer the items below. A calculator **may not** be used to assist with calculations necessary to answer items in Session 1.

1. Which number is equivalent to $4^3 \bullet 4^{-1}$?

A. $\frac{1}{64}$

B. $\frac{1}{16}$

C. 16

D. 64

2. What is $1.4\overline{5}$ written as a fraction?

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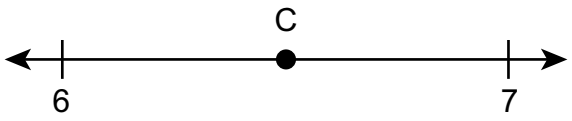
3. Determine whether each expression is equal to 9.

	Equal to 9	Not Equal to 9
$3^4 \div 3^{-2}$		
$\frac{3 \bullet 3^5}{3^3}$		
$3^{-4} + 3^6$		
$\frac{3^5}{3} \bullet \frac{3^{-4}}{3^{-2}}$		

4. Point C is shown on the number line.



Which irrational number could be represented by point C?

A. $\sqrt{6.5}$

B. $\sqrt{13}$

C. $\sqrt{43}$

D. $\sqrt{50}$

STOP.

STOP.

Answer the items below. A calculator **may** be used to assist with calculations necessary to answer items in Session 2.

1. Which conversion between the U.S. dollar and another currency has the greatest rate of change?

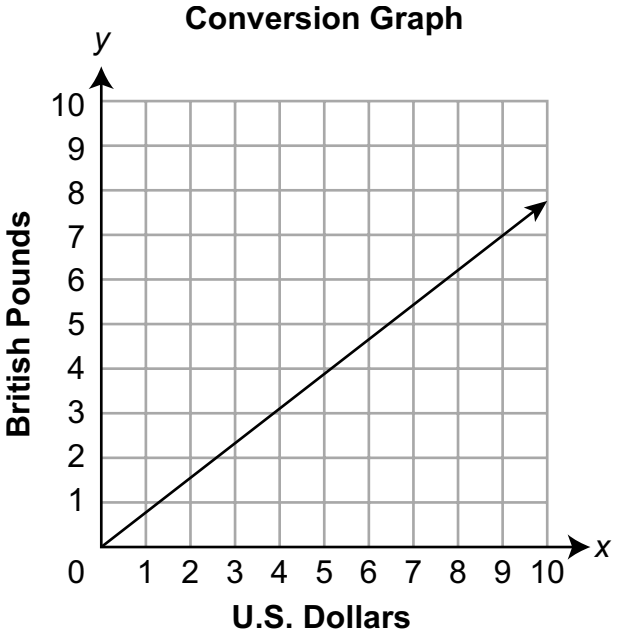
A. U.S. dollar, *x*, and UAE dirham, *y*
Conversion Formula: $y = 3.67x$

B. U.S. dollar, *x*, and European euro, *y*

Conversion Table

x	5	8	11	15
y	4.55	7.28	10.01	13.65

C. U.S. dollar, *x*, and British pound, *y*



D. U.S. dollar, *x*, and Peruvian sol, *y*
Conversion Ordered Pairs: (2, 6.54) and (7, 22.89)

Go on to the next page.

2. Linear function A can be represented by the equation $y = 3x - 4$. The table shows some of the values of linear function B.

Function B

x	$^{-}3$	6	9
y	$^{-}7$	5	9

Which statement about the two functions is correct?

A. The rate of change of function B is greater than the rate of change of function A; the *y*-intercept of function B is greater than the *y*-intercept of function A.

B. The rate of change of function B is greater than the rate of change of function A; the *y*-intercept of function B is less than the *y*-intercept of function A.

C. The rate of change of function B is less than the rate of change of function A; the *y*-intercept of function B is greater than the *y*-intercept of function A.

D. The rate of change of function B is less than the rate of change of function A; the *y*-intercept of function B is less than the *y*-intercept of function A.

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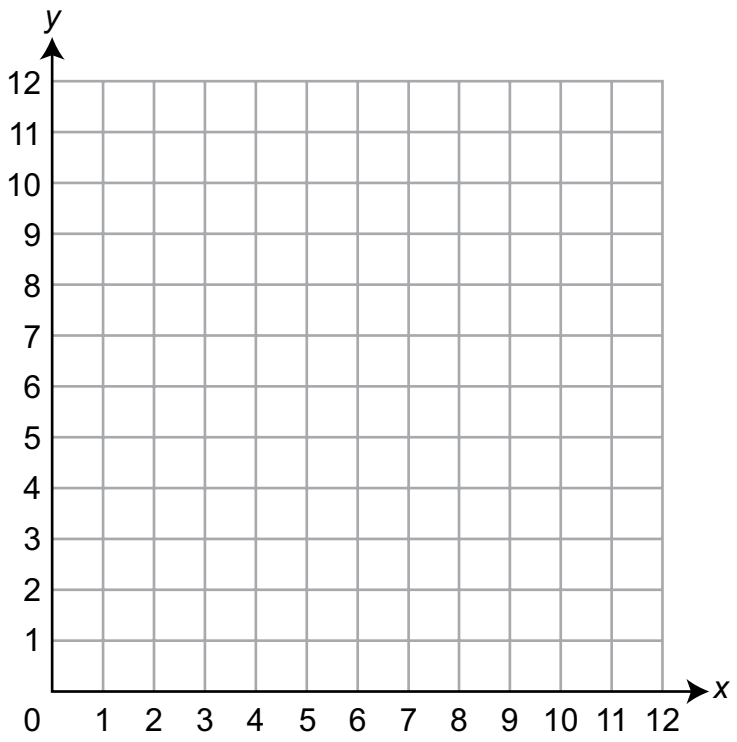
3. The coordinates of two opposite vertices of square PQRS are (2, 1) and (5, 4). Square PQRS is dilated by a scale factor of 2 to create square P'Q'R'S'. The dilation is centered at the origin. Plot the vertices of square P'Q'R'S' on the coordinate plane.



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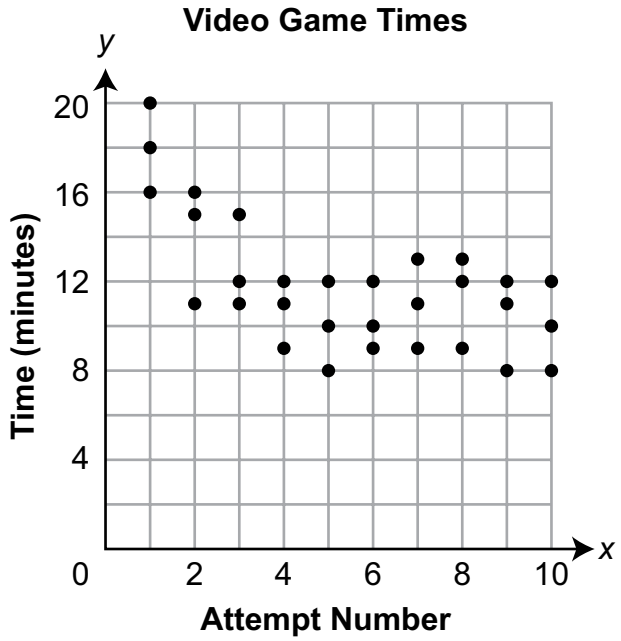
4. Three players are attempting to beat a video game in the fastest time. The times for each of their first ten attempts are shown on the scatter plot.



Which statement about the scatter plot is correct?

A. There is a negative, linear association on the scatter plot.

B. There is a negative, nonlinear association on the scatter plot.

C. There is a positive, linear association on the scatter plot.

D. There is a positive, nonlinear association on the scatter plot.

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5. Ana is graphing function F on a coordinate plane. What is the maximum number of different output values of F for an input value of 2?

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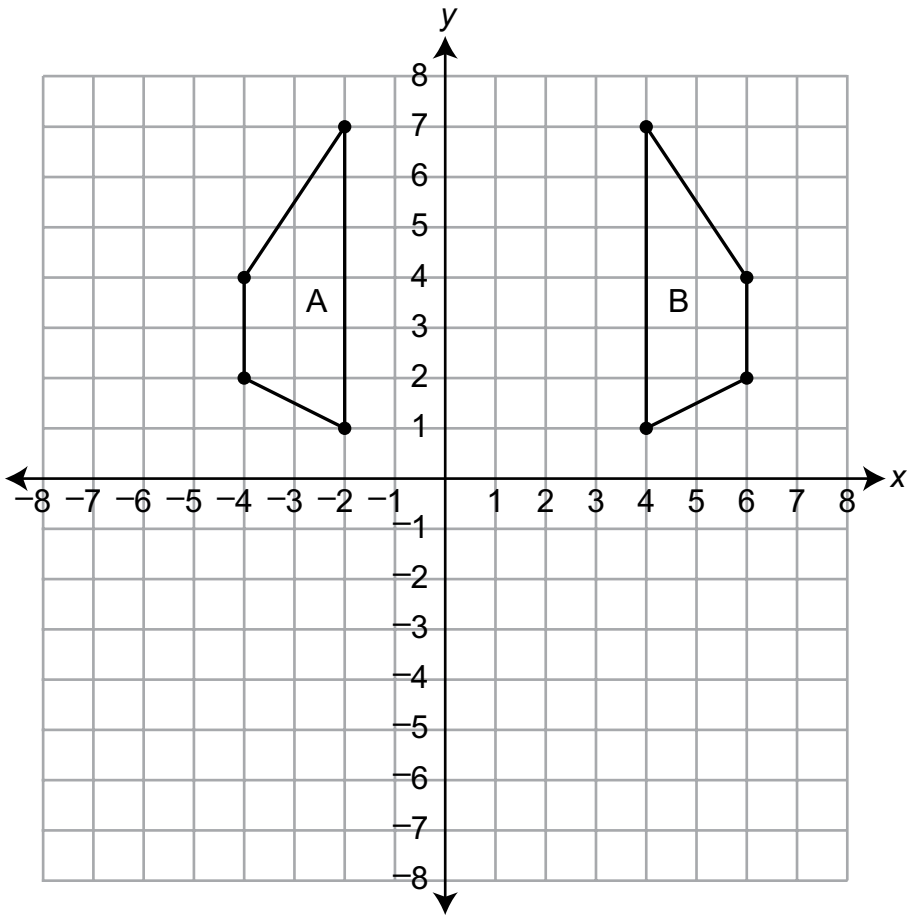
6. Figure A and figure B are shown on the coordinate grid.



Which transformation could be used to map figure A onto figure B?

A. a reflection over the line $x = 1$

B. a reflection over the line $y = 1$

C. a rotation of 180° about the origin

D. a translation of 6 units to the right

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7. A hot-air balloon is fueled by propane gas. A pilot records her use of propane gas, y, in gallons, per minute, x, over several flights. She determines that the linear model that best represents her data is $y = 40 - \frac{2}{5}x$. What does the slope represent in the pilot's model?

A. The hot-air balloon uses 2 gallons of propane gas every 5 minutes.

B. The hot-air balloon uses 5 gallons of propane gas every 2 minutes.

C. The hot-air balloon uses $\frac{2}{5}$ gallon of propane gas every 40 minutes.

D. The hot-air balloon uses $\frac{5}{2}$ gallons of propane gas every 40 minutes.

8. An equation is shown.

$8 - 2(x + 10) = 4x - 6$

What is the value of x?

A. $^{-}33$

B. $^{-}8$

C. $^{-}1$

D. 4

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9. A farmer is plowing her fields. She has already plowed 12 acres. After 4 hours she has plowed 36 acres. Which equation could the farmer use to find the number of acres, y, she will have plowed after x hours?

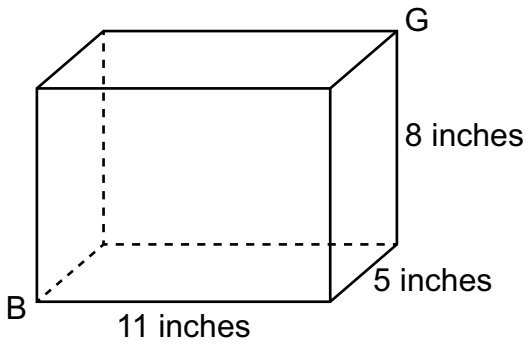
A. $y = 6x + 12$

B. $y = 9x + 12$

C. $y = 12x + 6$

D. $y = 12x + 9$

10. A rectangular prism is shown.



Rounded to the nearest tenth of an inch, what is the distance from vertex B to vertex G?

A. 9.4

B. 12.1

C. 13.6

D. 14.5

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11. A group of 7th graders and a group of 12th graders were asked whether they have a pet. Some of the results are shown in the two-way table.

	Have a Pet	Do Not Have a Pet	Total
7th Graders		108	
12th Graders	76		
Total		237	500

What percentage of the students questioned were 12th graders?

STOP.

STOP.

SUMMARY DATA

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
Session 1 (Non-Calculator)				
1	8.EE.1	C	1	The question asks the student to determine an equivalent expression using the properties of exponents. A. Incorrect. The student multiplies the exponents. B. Incorrect. The student determines the sum of 3 and $^{-}1$ as $^{-}2$. C. Correct. The student adds the exponents to get 2 and calculates 4 to the power of 2. D. Incorrect. The student multiplies the exponents and determines the product of 3 and $^{-}1$ as 3.
2	8.NS.1	Exemplar: $\frac{131}{90}$	2	The question asks the student to convert a decimal to a fraction. To receive full credit, the student must enter $\frac{131}{90}$ or an equivalent fraction.
3	8.EE.1	See Annotations	1	The question asks the student to determine equivalent expressions using the properties of exponents. To receive full credit, the student must choose the first three expressions as not equal to 9 and the last expression as equal to 9.

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
4	8.NS.2	C	2	The question asks the student to approximate the value of an irrational number using a number line. A. Incorrect. The student uses the approximate location of the point as the value under the square root. B. Incorrect. The student divides 13 by 2 instead of taking the square root. C. Correct. The student determines the square roots of 36 and 49 are 6 and 7 and uses a value in between. D. Incorrect. The student chooses an irrational number close to 7.

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
Session 2 (Calculator)				
1	8.EE.5	A	3	The question asks the student to compare different rates of change. A. Correct. The student determines the rate of change as 3.67 using the equation. B. Incorrect. The student determines the rate of change as the *y*-value of the first ordered pair in the table. C. Incorrect. The student determines the rate of change as the greatest *y*-value of the graphed line. D. Incorrect. The student determines the rate of change as the *y*-value of the first ordered pair.
2	8.F.2	C	2	The question asks the student to compare the properties of two functions. A. Incorrect. The student determines the rate of change for function B as 12 by using the change between the first two *y*-values of the table. B. Incorrect. The student switches the slope and *y*-intercept values. C. Correct. The student determines the rate of change of function A as 3 and the *y*-intercept as $^{-}4$. The student determines the rate of change of function B as $\frac{4}{3}$ and the *y*-intercept as $^{-}3$. D. Incorrect. The student determines the *y*-intercept of function A as 4.

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
3	8.G.3	See Annotations	2	The question asks the student to dilate a square. To receive full credit, the student must plot points at (4, 2), (10, 2), (4, 8), and (10, 8).
4	8.SP.1	B	1	The question asks the student to determine the association of a scatter plot. A. Incorrect. The student switches the meanings of linear and nonlinear associations. B. Correct. The association is negative because the trend of the data is down and to the right. The association is nonlinear because the points are scattered. C. Incorrect. The student switches the meanings of positive and negative and linear and nonlinear associations. D. Incorrect. The student switches the meanings of positive and negative associations.
5	8.F.1	Exemplar: 1	1	The question asks the student to determine the number of possible outcomes of a function. To receive full credit, the student must enter 1 or an equivalent value.

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
6	8.G.2	A	2	The question asks the student to determine the transformation between two-dimensional figures. A. Correct. The student determines the figures are reflections of each other and the line $x = 1$ is centered between them. B. Incorrect. The student switches the *x*- and *y*-axes. C. Incorrect. The student thinks a rotation is required to have a resulting figure in a different quadrant. D. Incorrect. The student compares the vertices ($^{-}2$, 1) and (4, 1) instead of the figures.

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
7	8.SP.3	A	2	The question asks the student to interpret the slope of a linear model. A. Correct. The student uses the defined variables for the slope as $\frac{\text{change in } y \text{ (gallons)}}{\text{change in } x \text{ (minutes)}}$. B. Incorrect. The student uses the defined variables for the slope as $\frac{\text{change in } x \text{ (minutes)}}{\text{change in } y \text{ (gallons)}}$. C. Incorrect. The student uses the slope as the number of gallons and the *y*-intercept as the number of minutes. D. Incorrect. The student uses the reciprocal of the slope as the number of gallons and the *y*-intercept as the number of minutes.
8	8.EE.7b	C	2	The question asks the student to solve the equation for *x*. A. Incorrect. The student subtracts 2 from 8 when simplifying the left side of the equation. B. Incorrect. The student subtracts 2 from 8 to get 6 and distributes 6 to *x*. C. Correct. The student distributes the $^{-}2$, combines like terms, and solves the equation. D. Incorrect. The student does not distribute $^{-}2$ to 10.

Grade 8

Sample Number	Alignment	Answer Key	Depth of Knowledge	Annotations
9	8.F.4	A	2	The question asks the student to write an equation for a situation. A. Correct. The student subtracts 12 from 36 to get 24 and divides 24 by 4 to get 6 as the rate of change. B. Incorrect. The student divides 36 by 4 to get 9 as the rate of change. C. Incorrect. The student switches the rate of change and *y*-intercept values in the equation. D. Incorrect. The student divides 36 by 4 to get 9 and switches the rate of change and *y*-intercept values in the equation.
10	8.G.7	D	2	The question asks the student to use the Pythagorean Theorem to determine the distance between two vertices. A. Incorrect. The student calculates the length of the diagonal of the right face. B. Incorrect. The student calculates the length of the diagonal of the bottom face. C. Incorrect. The student calculates the length of the diagonal of the front face. D. Correct. The student calculates the diagonal of the bottom face and uses it to calculate the distance between vertex B and vertex G.
11	8.SP.4	Exemplar: 41	2	The question asks the student to determine a relative frequency from a partially completed two-way table. To receive full credit, the student must enter 41 or an equivalent value.