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Section 2, Module 1: Math



1

Mark for Review

In order to maximize its size, a club wants to track its growth over time. The club starts with 20 students in the initial month, and observes that its size triples every 2 months. After 4 months from the initial month, what will be the size of the club?

(A) 60 students



(B) 120 students



(C) 180 students



(D) 360 students



TESTQUBE

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2

Mark for Review

James and Tommy are trying to fill a tank with a capacity of 20 liters. James can fill the tank at a rate of 2 liters per minute, while Tommy can fill the tank at a rate of 1 liter per minute. If x represents the number of minutes James fills the tank and y represents the number of minutes Tommy fills the tank, which equation represents the situation?

(A) $2x + y = 20$ (B) $2x - y = 20$ (C) $x + 2y = 20$ (D) $x - 2y = 20$ 

TESTQUBE

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3

Mark for Review

Jimmy is curious if he can earn a total grade of 80 or above in his class. The class grade is made up of three components: homework (20%), the final exam (30%), and projects (50%). If Jimmy earns 80 points in homework and 100 points in projects, what is the minimum number of points he needs to obtain in the final exam to achieve a total grade of 80 or above? (Note: Each assessment criteria has a full score of 100 points.)

(A) 47



(B) 46



(C) 45



(D) 40



TESTQUBE

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Mark for Review

Suppose you have a 10-liter tank of saltwater that contains 2 kilograms of salt. If you add 3 liters of fresh water to the tank and mix it thoroughly, which choice best approximates the concentration, kilograms per liter, of salt in the tank?

(A) 0.1 kg/L



(B) 0.15 kg/L



(C) 0.13 kg/L



(D) 0.2 kg/L



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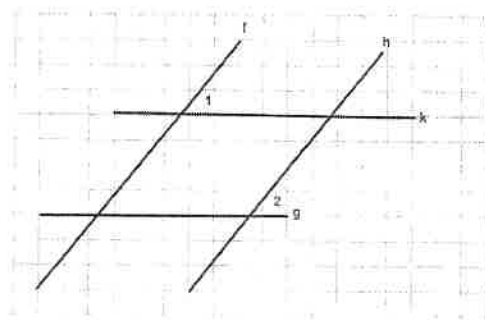
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Mark for Review

In the figure below, lines k and g are parallel and lines f and h are parallel. If the measure of $\angle 2$ is 30° , what is the measure of $\angle 1$, in degrees?



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6

Mark for Review

Consider the equation $y = x^2 - 26x + 169$ in the xy -plane. If the equation intersects the line $y = 0$ at exactly one point, what is the coordinate of that point?

☐ (A) (13, 0)

☐ A

☐ (B) (0, 13)

☐ B

☐ (C) (26, 0)

☐ C

☐ (D) (0, 26)

☐ D

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Annotate

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Mark for Review

If $5x + 6y = 30$ and $x + 4 = 4$, what is the value of y ?

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Annotate

9

Mark for Review

Jenny wants to put a gift inside a box with a length of 10 inches, a width of 8 inches, and a height of 6 inches. However, she realizes that the gift is slightly larger than the box and decides to increase the length of the box by 10% to make it fit. What is the volume of the new box?

(A) 480 cubic inches

(B) 528 cubic inches

(C) 5280 cubic inches

(D) 40 cubic inches

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TESTQUBE

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Annotate

8

Mark for Review

James rolls a fair six-sided dice two times. What is the probability that the second number he rolls is 6?

(A) $1/36$ (B) $1/18$ (C) $1/12$ (D) $1/6$

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Annotate

10

Mark for Review

For the function g defined below, a is a constant and $g(2) = 24$. What is the value of a ?

$$g(x) = ax^3 + 8$$

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11

Mark for Review

What is the volume, in cubic centimeters, of a cone with three times the radius and half the height of a cone whose volume is 30 cubic centimeters?

- (A) 15 cubic centimeters
- (B) 45 cubic centimeters
- (C) 90 cubic centimeters
- (D) 135 cubic centimeters

TESTQUBE

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12

Mark for Review

Alice works a total of 12 hours per week, x hours as an engineer and y hours as a tutor. She earns \$12 per hour as an engineer and \$20 per hour as a tutor. Alice wants to earn at least \$300 per week. Which of the following systems of inequalities represents this situation?

- (A) $x + y \geq 12, 12x + 20y = 300$
- (B) $x + y \geq 12, 12x + 20y \geq 300$
- (C) $x + y = 12, 12x + 20y \leq 300$
- (D) $x + y = 12, 12x + 20y \geq 300$

TESTQUBE

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13

Mark for Review

Find one value of x where the equation $|x^2 - 2x + 1| - 1$ equal to 0.

TESTQUBE

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Mark for Review

If $2x - y = 4$, what is the value of $4^x \div 2^y$?

- (A) 16
- (B) 8
- (C) 4
- (D) 2

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Annotate

15

Mark for Review

Eve wants to rent an apartment. The monthly rental cost is \$1600, and she needs to pay a \$300 deposit. Eve wants to keep her rental expenses under \$12,000, and the apartment rental must be for a whole number of months. What is the maximum number of months she can rent the apartment for?

☐ (A) 6 months☐ (A)☐ (B) 7 months☐ (B)☐ (C) 8 months☐ (C)☐ (D) 9 months☐ (D)

TESTQUBE

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Annotate

16

Mark for Review

James runs at a constant speed of 2 kilometers per hour. How many hours will it take for him to travel 52 kilometers?

TESTQUBE

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Annotate

17

Mark for Review

In the given system of equations, a is a positive constant. If the system has no solution, what is the value of a ?

$$\begin{aligned} 6x + 8y &= 15 \\ 3x - 6 &= ay \end{aligned}$$

☐ (A) 4☐ (A)☐ (B) -4☐ (B)☐ (C) 8☐ (C)☐ (D) -8☐ (D)

TESTQUBE

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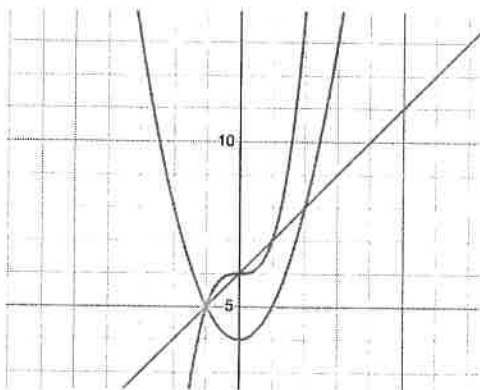
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Mark for Review

The given graph shows three distinct functions. From the graph, how many solutions are there that satisfy all three functions?



(A) 1

Ⓐ

(B) 2

Ⓑ

(C) 3

Ⓒ

(D) 4

Ⓓ

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Mark for Review

The given equation relates the numbers c , b , and a . Which of the equations correctly expresses c in terms of a and b ?

$$2c^2 - 6b = 8a$$

(A) $c = (4a + 3b)$

Ⓐ

(B) $c = (4a + 3b)^2$

Ⓑ

(C) $c = (4a + 3b)^{1/2}$

Ⓒ

(D) $c = (4a + 3b)^{\sqrt{2}}$

Ⓓ

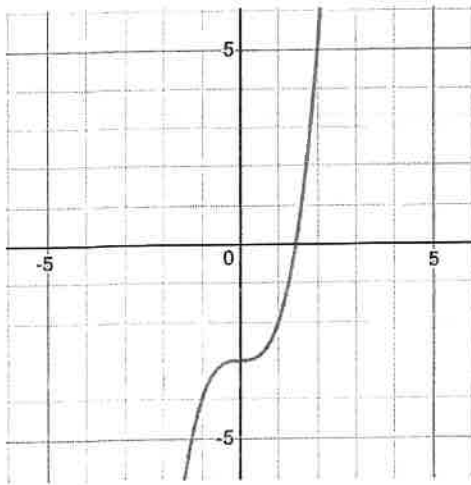
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Mark for Review

What is the y -intercept of the graph shown?

(A) -1

(B) -4

(C) 1.5

(D) None of the above

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Annotate

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Mark for Review

Which of the following is equivalent to $8^{2/3}$?

(A) 16

(B) 4

(C) 8

(D) 32

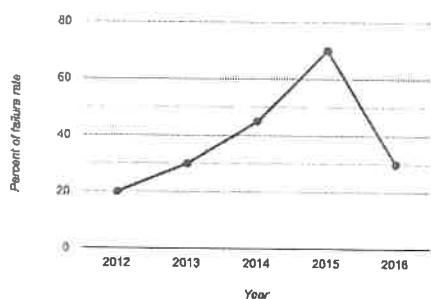
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22

Mark for Review

The line graph illustrates the percentage of students who failed a class over the years. Which interval on the graph represents the greatest percentage change?

☒ A 2012 – 2013☐ A☐ B 2013 – 2014☐ B☐ C 2014 – 2015☐ C☐ D 2015 – 2016☐ D