1

$$s = 50 + 4t$$

The equation gives the speed s, in miles per hour, of a certain car t seconds after it began to accelerate. What is the speed, in miles per hour, of the car 2 seconds after it began to accelerate?

Ⓐ 50

Ⓑ 52

Ⓒ 54

Ⓓ 58

2

Which expression is equivalent to $7x^2 + 8x$?

Ⓐ $x(7x + 8)$

Ⓑ $7x(x + 8)$

Ⓒ $8x(7x + 1)$

Ⓓ $x^2(7x + 8)$

3

The function f is defined by $f(x) = x^2 + 24$. What is the value of $f(5)$?

Ⓐ 5

Ⓑ 24

Ⓒ 29

Ⓓ 49

4

Which expression is equivalent to $(x^3 + 3x^2 - 6x) + 4(x^2 + 6)$?

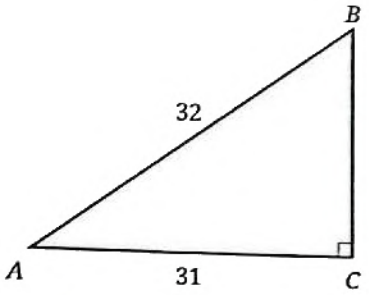
Ⓐ $x^3 + 7x^2 - 6x + 24$

Ⓑ $x^3 + 3x^2 - 6x + 24$

Ⓒ $x^3 + 4x^2 - 6x + 24$

Ⓓ $x^3 + 6x^2 - 6x + 24$

5



Note: Figure not drawn to scale.

What is the value of cos A in the triangle shown?

Ⓐ $\frac{32}{31}$

Ⓑ $\frac{31}{32}$

Ⓒ $\frac{1}{32}$

Ⓓ $\frac{1}{31}$

6

Jasmin grows bean pods in her garden. This year, she harvested 490 bean pods and saved 10% of them to plant next year. How many of the harvested bean pods did Jasmin save to plant next year?

Ⓐ 39

Ⓑ 49

Ⓒ 57

Ⓓ 59

7

If $3x - 8 = 7$, what is the value of $3x + 8$?

Ⓐ -1

Ⓑ 5

Ⓒ 13

Ⓓ 23

8

$y < x$

$x < 24$

For which of the following tables are all the values of a and their corresponding values of y solutions to the given system of inequalities?

Ⓐ

x	y
21	20
22	21
23	22

Ⓑ

x	y
21	22
22	23
23	24

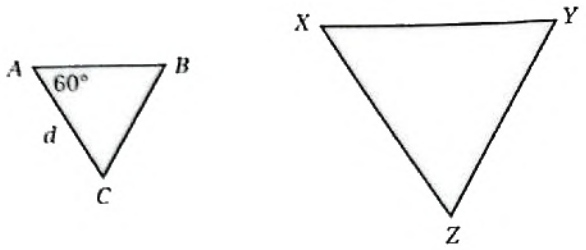
Ⓒ

x	y
21	24
22	25
23	26

Ⓓ

x	y
21	26
22	27
23	28

9



Note: Figures not drawn to scale.

For the triangles shown, triangle ABC is dilated by a scale factor of 3 to obtain triangle XYZ, where $d = 16$. What is the measure, in degrees, of angle X?

Ⓐ 20

Ⓑ 57

Ⓒ 60

Ⓓ 63

10

A box contains 23 red buttons and 27 blue buttons. If one of these buttons is selected at random, what is the probability of selecting a red button? (Express your answer as a decimal or fraction, not as a percent.)

11

What is an x-coordinate of an x-intercept of the graph of $y=4(x-13)(x+5)(x+1)$ in the xy-plane?

12

The length of a side of square X is 9 centimeters. The area of rectangle Y is 24 square centimeters. What is the total area, in square centimeters, of square X and rectangle Y?

Ⓐ 66

Ⓑ 81

Ⓒ 105

Ⓓ 129

13

Before liftoff, one of a space shuttle's solid rocket boosters contained 489,000 kilograms (kg) of propellant. Exactly 23 seconds after liftoff, 374,046 kg of this propellant remained. On average, how much propellant, in kg, did this solid rocket booster burn each second after liftoff?

14

$$y = 0.25x^2 - 7.5x + 80.25$$

The equation gives the estimated stock price y, in dollars, for a certain company x days after the company went public, where $0 \le x \le 20$. Which statement is the best interpretation of $(x, y) = (1,73)$ in this context?

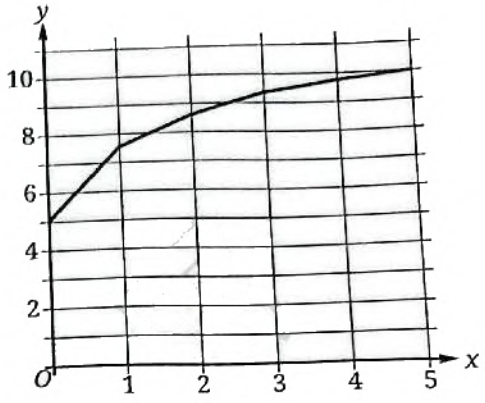
Ⓐ The company's estimated stock price increased \$73 every day after the company went public.

Ⓑ The company's estimated stock price increased \$1 every 73 days after the company went public.

Ⓒ 1 day after the company went public, the company's estimated stock price is \$73.

Ⓓ 73 days after the company went public, the company's estimated stock price is \$1.

15



The graph gives the estimated population y, in thousands, of a town x years since 2001, where $0 \le x \le 5$. Which of the following best describes the increase in the estimated population from $x = 0$ to $x = 1$?

Ⓐ The estimated population at $x = 1$ is 0.5 times the estimated population at $x = 0$.

Ⓑ The estimated population at $x = 1$ is 1.5 times the estimated population at $x = 0$.

Ⓒ The estimated population at $x = 1$ is 2.5 times the estimated population at $x = 0$.

Ⓓ The estimated population at $x = 1$ is 3.5 times the estimated population at $x = 0$.

16

The population of City A increased by 9% from 2015 to 2016. If the 2016 population is k times the 2015 population, what is the value of k?

Ⓐ 0.09

Ⓑ 0.9

Ⓒ 1.09

Ⓓ 1.9

17

Circle A in the xy-plane has the equation $(x+8)^2+(y-8)^2=4$. Circle B has the same center as circle A. The radius of circle B is two times the radius of circle A. The equation defining circle B in the xy-plane is $(x+8)^2+(y-8)^2=k$, where k is a constant. What is the value of k?

18

If a circuit consists of resistors connected in series, its resistance, in ohms, is equal to the sum of the resistances, in ohms, of all these resistors. A particular circuit consists of x identical resistors of type X and y identical resistors of type Y, which are connected in series. The resistance R, in ohms, of this circuit is given by the equation $R=13x+15$. Which of the following is the best interpretation of 13 in this context?

Ⓐ The total resistance of all resistors of type X in the circuit is 13 ohms.

Ⓑ The resistance of the circuit increases by 13 ohms with each addition of a resistor to the circuit.

Ⓒ The resistance of the circuit increases by $13x$ ohms with each addition of a resistor of type X to the circuit.

Ⓓ The resistance of the circuit increases by 13 ohms with each addition of a resistor of type X to the circuit.

19

The function f is defined by $f(x) = 20x$. For what value of x is $f(x) = 140$?

20

The ratio x to y is equivalent to the ratio 7 to 9. If $x = 10t$, what is the value of y in terms of t?

Ⓐ $\frac{7}{90}t$

Ⓑ $\frac{9}{70}t$

Ⓒ $\frac{70}{9}t$

Ⓓ $\frac{90}{7}t$

21

The function g is defined as $g(x) = \frac{2x-4}{(x+13)(x-5)}$, where a is a constant, what is the value of a?

22

The function g is defined by $g(x) = \frac{1}{m}x + 21$, where m is an integer constant and $14 \leq m \leq 17$. For the graph of $y = g(x) - 9$ in the xy-plane, what is the x-coordinate of a possible x-intercept?

Module 1:
Math

1	D
2	A
3	D
4	A
5	B
6	B
7	D
8	A
9	C
10	23/50
11	13 or -5 or -1
12	C
13	4998
14	C
15	B
16	C
17	16
18	D
19	7
20	C
21	
22	-168 or -180 or -192 or -204