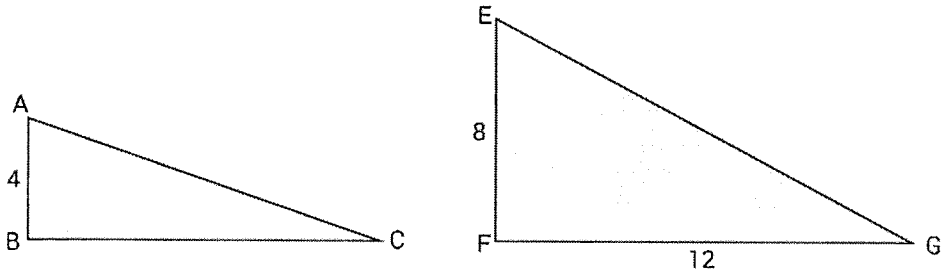
WEEK3.2

Mathematics—Module 2

1. In the figures below (not drawn to scale), right triangle ΔABC is similar to ΔEFG. What is the ratio of the area of ΔABC to the area of ΔEFG?



2. The function f is defined by a polynomial. The table below gives values for x and $f(x)$. Which of the following must be a factor of $f(x)$?

x	$f(x)$
0	4
1	2
2	0

A) x
B) $x - 1$
C) $x + 2$
D) $x - 2$

3. In the system of equations below, a is a constant and x and y are variables. For which of the following values of a will the system have no solution?

$$x + 3y = -7$$
$$ax - 2y = 6$$

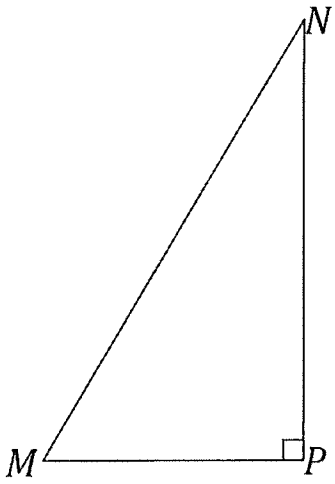
A) $-\frac{2}{3}$
B) $-\frac{1}{3}$
C) 0
D) $\frac{7}{3}$

4. What is the sum of all values of x that satisfy the following equation?

$$5x^2 - 30x - 32 = 3$$

A) −1
B) 0
C) 6
D) 7

5. In right triangle MNP below, angle M measures $a°$ and $\cos a° = \frac{3}{5}$. What is $\cos(90 - a°)$?



6. If 52% of 25 people polled in a coffee survey preferred Brand A and 48% preferred Brand B, which of the following inferences is a logical conclusion?

A) At least 52% of shoppers will prefer Brand A over Brand B.
B) The majority of shoppers will prefer Brand A over Brand B.
C) The majority of shoppers will prefer Brand B over Brand A.
D) The number of shoppers who prefer Brand A may be similar to the number of shoppers who prefer Brand B.

7. Ben bought a bag of assorted rubber balls and measured each one. Each had a diameter between 1.2 and 1.5 inches. What is a possible volume, rounded to the nearest cubic inch, of one of the balls? Use 3.14 for π.

8. How many gallon jugs of water should Julia buy to completely fill a container in the shape of a rectangular prism if the length is 8 feet, the width is 4 feet, and the height is 3 feet (1 gallon = 231 cubic inches)?

A) 5
B) 718
C) 719
D) 165,888

9. Subtract the polynomials: $(2x^2 + 3x + 2) - (x^2 + 2x - 3)$

A) $x^2 + x + 5$
B) $x^2 + x - 1$
C) $x^2 + 5x + 5$
D) $x^2 + 5x - 1$

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10. The table below shows the breakdown of orders at a frozen yogurt shop. There were two flavors of yogurt (strawberry and lemon) and two sizes (small and large). If a person among those who ordered frozen yogurt is chosen at random, what is the probability that this person ordered a small serving of lemon yogurt?

	Strawberry	Lemon	Total
Small	12	9	21
Large	20	16	36
Total	32	25	57

A) $\frac{9}{25}$
B) $\frac{3}{7}$
C) $\frac{7}{19}$
D) $\frac{3}{19}$

11. If (x, y) is the solution to the following system of equations, what is the value of $x + y$?

$$3x + y = -2$$
$$y = -x$$

A) -1
B) 0
C) 1
D) 2

Refer to the following for questions 12 - 13:

Elise, Max, and Rylie are each offering lawn care services. Their prices for each service are listed in the table below. Prices are per square foot.

	Elise	Max	Rylie
Mowing	\$0.0025	\$0.002	\$0.003
Edging	\$0.0015	\$0.0015	\$0.002
Weeding	\$0.055	\$0.065	\$0.05

12. Rylie was asked to mow and edge a lawn as well as weed a 1,000 square foot garden. If she will spend \$12 on gas and other overhead costs, how large of a lawn does she need to be able to make a \$75 profit?

A) 2,600 ft^2
B) 5,000 ft^2
C) 6,875 ft^2
D) 7,400 ft^2

13. Ms. Lin wants to have her 7,500 square foot lawn mowed and edged. She also has a flower bed of x square feet to be weeded. Which of the following inequalities represents x if Elise's services are a better deal than Max's?

A) $x < 250$
B) $x < 375$
C) $x > 250$
D) $x > 375$

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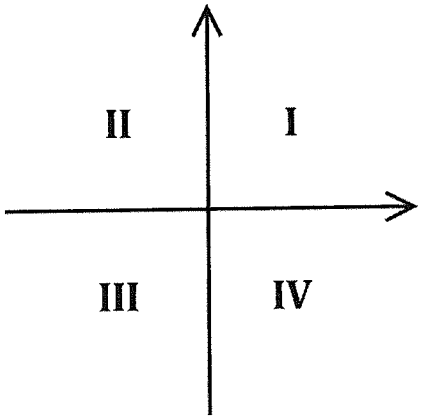
14. A number of cash prizes were awarded for the top salespeople at ABC Communications, each in the amount of $100, $200, or $400. If the prizes totaled $1,600 and there were 7 total prizes awarded, what is the greatest possible number of $100 prizes awarded?

15. The graph of the system of inequalities $y \leq \frac{2}{3}x - \frac{3}{2}$ and $y \geq -2x - \frac{5}{2}$ has solutions in which quadrants on the xy-plane below?



A) Quadrants I and IV
B) Quadrants II and III
C) Quadrants I, II, and IV
D) Quadrants I, III, and IV

16. The equation below is used to solve for the distance, d (meters), that an object travels in a certain amount of time, t (seconds), with an initial velocity of v meters per second. Which of the following equations gives a in terms of d, v, and t?

$$d = vt + \frac{1}{2}at^2$$

A) $\frac{2d-2vt}{t}$
B) $\frac{2dvt}{t^2}$
C) $\frac{2d}{t^2} - \frac{2v}{t}$
D) $\frac{2d}{t^2} - 2vt$

17. The function f is defined by a polynomial. The table below gives values for x and $f(x)$. Which of the following must be a factor of $f(x)$?

x	$f(x)$
−5	14
−3	0
−1	−6

A) $x + 3$
B) $x - 3$
C) $x + 5$
D) $x - 5$

18. Simplify the following expression.

$$(3x + 5)(4x - 6)$$

A) $12x^2 - 38x - 30$
B) $12x^2 + 2x - 30$
C) $12x^2 - 2x - 1$
D) $12x^2 + 2x + 30$

19. If (x, y) is the solution to the following system of equations, what is the value of $x - y$?

$$4x - y = 11$$
$$x = 3y$$

A) 0
B) 1
C) 2
D) 3

20. The equation below is used to calculate the period of a pendulum (i.e., the time it takes a pendulum to make one full oscillation). If T refers to the time in seconds, L is the length of the pendulum in meters, and g is the acceleration due to gravity in meters per second squared, which of the following equations gives L in terms of T, g, and π?

$$T = 2\pi\sqrt{\frac{L}{g}}$$

A) $(T - 2\pi)^2 g$
B) $g\sqrt{\frac{T}{2\pi}}$
C) $\frac{T^2 g}{4\pi^2}$
D) $\frac{4\pi^2}{T^2 g}$

21. If $x > 0$ and $x^2 - 4x = 12$, what is the value of x?

22. In the function below, b is a constant. If $f(2) = 0$, what is the value of $f(-1)$?

$$f(x) = \frac{3}{2}x + b$$

A) $-\frac{9}{2}$
B) -3
C) $-\frac{3}{2}$
D) $\frac{3}{2}$