

Name \_\_\_\_\_

Key

1. Simplify the expression below.

$$x^4 \cdot x^4 \cdot x^4$$

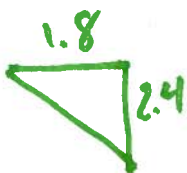
(A)  $3x^4$

(B)  $x^{12}$

(C)  $3x^{12}$

(D)  $x^{64}$

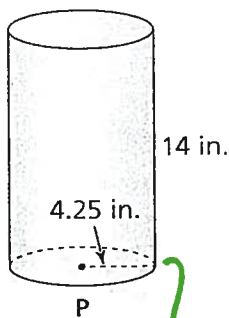
2. The library is located 1.8 miles west of Callie's house. The grocery store is located 2.4 miles south of the library. What is the length of a straight line between Callie's house and the grocery store?



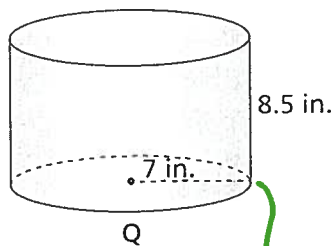
$$1.8^2 + 2.4^2 = c^2$$

$$c = 3 \text{ miles}$$

3. Two cylinders are shown below. Which cylinder has the greatest volume? Use 3.14 for  $\pi$ . Round to the nearest hundredth. Explain.



$$V = \pi r^2 \cdot h$$



$$\pi(4.25^2) \cdot 14 \quad \pi(7^2) \cdot 8.5$$

$$\approx 794.03 \quad \approx 1307.81$$

4. Which of the following functions are linear?

Function A

x	3	6	9	12	15
y	9	36	81	144	225

Function B

x	5	10	15	20	25
y	8	16	24	32	40

- (A) Function A  
(B) Function B  
(C) Function A and Function B  
(D) None of the above

constant rate of change

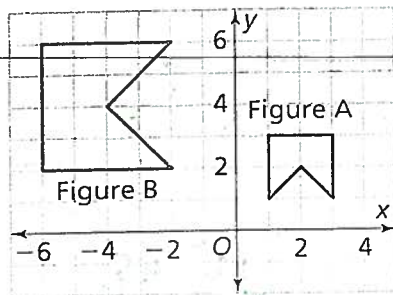
5. The results of a movie survey are represented in the two-way frequency table below.

Way to Watch Movies	People Surveyed		
	Male	Female	Total
Stream	17	29	46
Theater	33	21	54
Total	50	50	100

Which of the following statements is true? Select all that apply.

- ☐ More males than females prefer to stream movies.  
☒ More females prefer to stream movies.  
☒ More males prefer to watch movies in a theater.  
☐ More females prefer to watch movies in a theater.  
☒ More people prefer to watch movies in a theater.

6. Describe a sequence of transformations that maps Figure A to Figure B.



90° rotation clockwise  
Dilation SF = 2

7. The side lengths of different triangles are given. Which triangle is a right triangle?

- (A) 6, 7, 13  
(B)  $\sqrt{21}$ ,  $\sqrt{99}$ , 11  
(C) 10, 60, 61  
(D)  $\sqrt{35}$ ,  $\sqrt{14}$ , 7

8. Morgan uses  $\frac{1}{4}$  of her supply of raisins to make trail mix and  $\frac{3}{8}$  of her supply of raisins to make cookies. If Morgan uses 5 pounds of raisins, how many pounds of raisins are in her supply?

- (A) 5 pounds  
(B) 8 pounds  
(C) 12 pounds  
(D) 15 pounds

$x = \text{supply}$   
 $\frac{1}{4}x + \frac{3}{8}x = 5$   
 $\frac{5}{8}x = 5$   
 $x = 8$

9. Jennie has 177 more songs downloaded on her mp3 player than Diamond. Together, they have 895 songs downloaded.

J = Jennie  
D = Diamond

#### Part A

What system of equations could be used to determine how many songs each girl has downloaded?

$$\begin{aligned} D + 177 &= J \\ J + D &= 895 \end{aligned}$$

#### Part B

How many songs does each girl have?

$$\begin{aligned} D + 177 + D &= 895 \\ 2D &= 718 \\ D &= 359 \\ 895 - 359 &= 536 = J \end{aligned}$$

10. The surface area of a sphere is 200.96 square centimeters. What is the approximate volume of the sphere? Use 3.14 for  $\pi$ . Round your answer to the nearest hundredth.

- (A) 66.99  $\text{cm}^3$   
(B) 133.97  $\text{cm}^3$   
(C) 267.95  $\text{cm}^3$   
(D) 334.94  $\text{cm}^3$

$SA = 4\pi r^2$   
 $200.96 = 4\pi r^2$   
 $16 = r^2$   
 $r = 4$   
 $V = \frac{4}{3}\pi r^3$   
 $V = 85\frac{1}{3}\pi$

11. Saturn is  $8.867 \times 10^8$  miles away from the Sun. Uranus is  $1.787 \times 10^9$  miles away from the Sun. Approximately how many times farther is Uranus from the Sun than Saturn is?

(A) 0.2 times  
 (B) 2 times  
 (C) 20 times  
 (D) 200 times

$$\frac{1.787 \times 10^9}{8.867 \times 10^8} = 2$$

12. Wylie is renting a bicycle from a local shop that charges \$5 to rent a helmet, plus an hourly rate of \$8.50 for the bike. For how long can Wylie rent a bicycle if he pays a total of \$47.50?

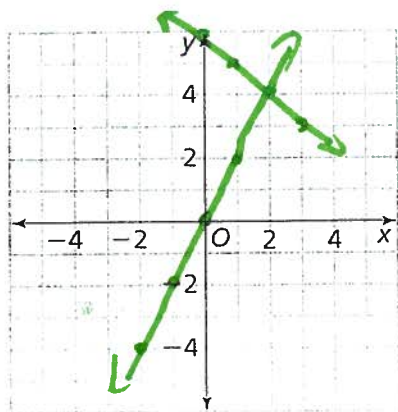
$$5 + 8.5x = 47.5$$

$$x = 5 \text{ hours}$$

13. Graph the system of equations below and find the solution.

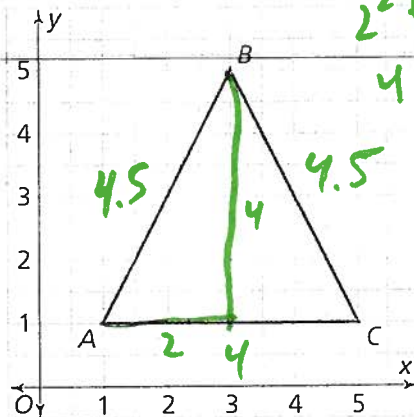
$$y = 2x$$

$$y = -x + 6$$



(2, 4)

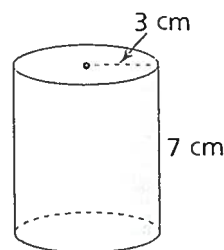
14. Zoe draws  $\triangle ABC$  on the coordinate plane.



What is the approximate perimeter of  $\triangle ABC$  to the nearest hundredth?

(A) 8.47 units  
 (B) 12 units  
 (C) 12.94 units  
 (D) 15.31 units

15. What is the approximate volume of the cylinder? Use  $\frac{22}{7}$  for  $\pi$ . Round to the nearest whole.



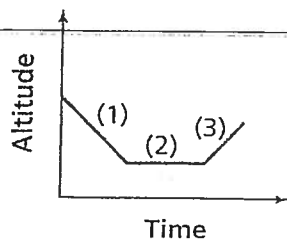
(A)  $66 \text{ cm}^3$   
 (B)  $132 \text{ cm}^3$   
 (C)  $198 \text{ cm}^3$   
 (D)  $264 \text{ cm}^3$

$$V = \pi r^2 h$$

$$V = \pi 9 \cdot 7$$

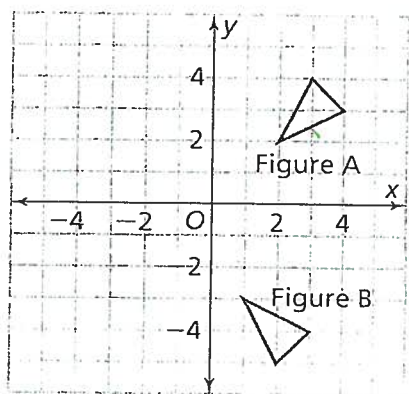
$$63\pi$$

16. How would you describe the graph of the function at interval 3? Select all that apply.



- ☐ The function is decreasing.  
☒ The function is increasing.  
☐ The function is constant.  
☐ The slope is negative.  
☒ The slope is positive.

17. What is the sequence of transformations that maps Figure A to Figure B?



Rotation  
Translation

21. What is the value of  $x$ ?

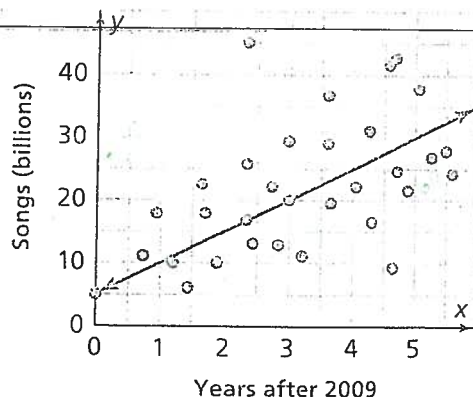
$$\frac{3}{5}x - \frac{1}{3}x = x - 1$$

$$x = \frac{15}{11}$$

$$\frac{4}{15}x = x - 1$$

$$-\frac{11}{15}x = -1$$

18. The scatter plot shows the total number of songs downloaded on a popular music service.



What is the equation of the linear model using two points on the line?

- (A)  $y = x + 10$   
 (B)  $y = 5x + 5$   
 (C)  $y = 10x + 1$   
 (D)  $y = 8x + 2$

19. A box has a base of 12 inches by 12 inches and a height of 30 inches. What is the length of the interior diagonal of the box? Round to the nearest hundredth.



20. Evaluate the expression when  $x = 4$  and  $y = 5$ .

$$3x^2 + 4y^0 \cdot x^{-1}$$

$$48 + 1$$

$$49$$

22. The graph of a function is a line that passes through the points (3, 17) and (6, 32). How would you find the rate of change for the function?

$$\text{slope} = \frac{32 - 17}{6 - 3} = \frac{15}{3} = 5$$