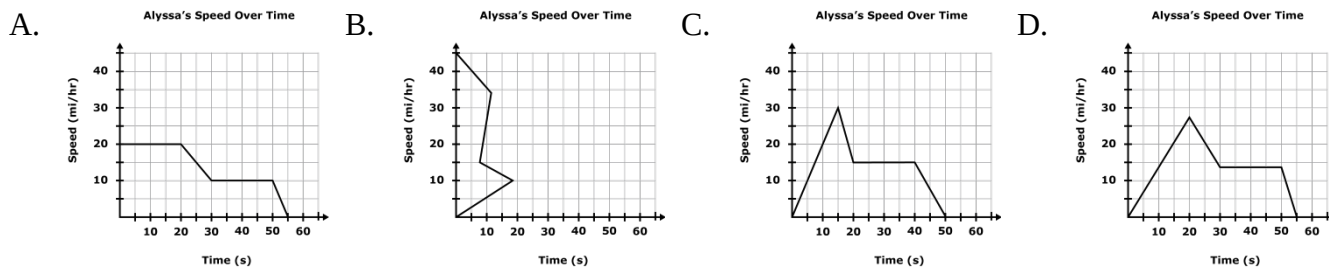


Directions: Answer the following question(s).

1 Alyssa is learning to drive her parents' car.

- She increases her speed for 20 seconds.
- She slows down for 10 seconds.
- She stays approximately the same speed for the next 20 seconds.
- She then slows down to a stop for the last 5 seconds.

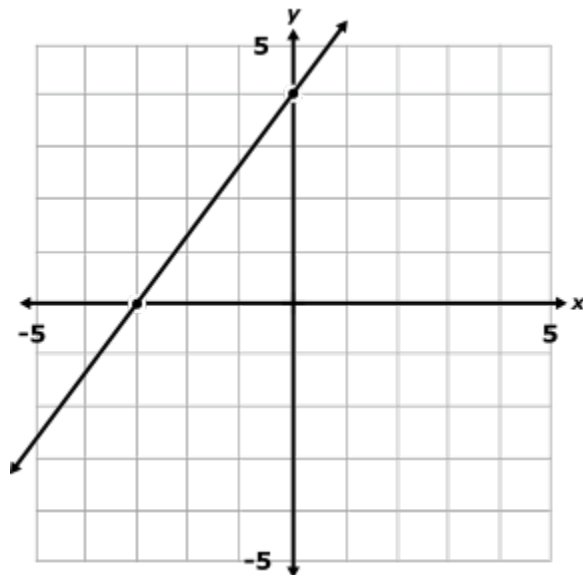
Select the graph that *best* represents Alyssa's speed over time.



2 Which of the following are equivalent to $(2^{-4} \cdot 2^3)^3$? Select *all* that apply.

- A. $\frac{1}{8}$ B. 8 C. $2^{-12} \cdot 2^9$ D. $2^{-1} \cdot 2^6$

3 The graph below represents a linear function.

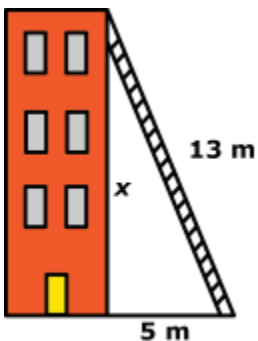


Which of the following equations represents the graph?

- A. $y = \frac{3}{4}x - 3$ B. $y = \frac{3}{4}x + 4$ C. $y = \frac{4}{3}x - 3$ D. $y = \frac{4}{3}x + 4$

Directions: Answer the following question(s).

4



A ladder that has a length of 13 m leans against a wall with the base of the ladder 5 m away from the bottom of the wall. Use this information to find how high above the ground the ladder meets the wall.

- A. $\sqrt{194}$ m B. 13 m C. 12 m D. 8 m

5

Select the equation that represents the function given in the table below.

x	y
-2	16
-1	11
1	1
2	-4

- A. $y = -\frac{1}{5}x + 6$ B. $y = 6x - \frac{1}{5}$ C. $y = -5x + 6$ D. $y = 6x - 5$

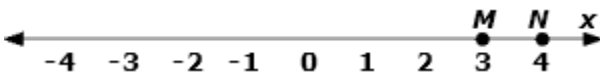
6

Which fraction is equal to $0.\overline{57}$?

- A. $\frac{52}{99}$ B. $\frac{19}{33}$ C. $\frac{26}{45}$ D. $\frac{19}{30}$

7

Is $\sqrt{15}$ located between points M and N on the number line below?



- A. No, because it is not greater than 3 and less than 4. B. No, because it is not greater than 9 and less than 16. C. Yes, because it is greater than 3 and less than 4. D. Yes, because it is greater than 9 and less than 16.

8

Directions: Answer the following question(s).

9 Let the numbers below represent the lengths of the sides of a triangle. Which of the triangles is a right triangle?

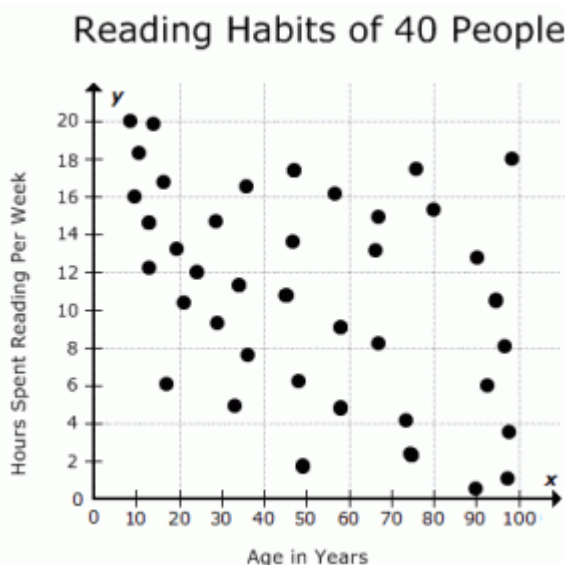
- I. 4, 5, 6
- II. 6, 8, 10
- III. 5, 13, 14
- IV. 7, 11, 13

- A. I B. II C. III D. IV

10 Which of the following statements is true about an approximation for $\sqrt{29}$?

- A. It should be to the left of 5 on a number line, since $\sqrt{29}$ is less than $\sqrt{25}$, which is equal to 5.
- B. It should be to the left of 5 on a number line, since $\sqrt{29}$ is greater than $\sqrt{25}$, which is equal to 5.
- C. It should be to the right of 5 on a number line, since $\sqrt{29}$ is less than $\sqrt{25}$, which is equal to 5.
- D. It should be to the right of 5 on a number line, since $\sqrt{29}$ is greater than $\sqrt{25}$, which is equal to 5.

11 Casey surveyed 40 people about their reading habits. She created the scatterplot below to show the ages of the people she surveyed and the number of hours per week each spends reading.

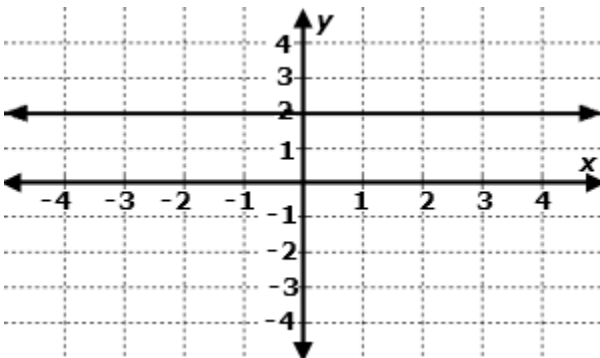


Which statement is **MOST** strongly supported by the scatterplot?

- A. There is a positive correlation between the age of a person and the amount of time they spend reading.
- B. There is a negative correlation between the age of a person and the amount of time they spend reading.
- C. There is no correlation between the age of a person and the amount of time they spend reading.
- D. There is both a positive correlation and a negative correlation between the age of a person and the amount of time they spend reading.

Directions: Answer the following question(s).

- 12 Which of these describes the function graphed below?



- A. y is increasing as x is increasing B. y is decreasing as x is increasing C. y is both increasing and decreasing as x is increasing D. y is neither increasing nor decreasing as x is increasing

- 13 Alistair writes the system of equations below.

$$2x + 3y = -60$$

$$2x + 3y = 120$$

Which statement describes the solution to this system of equations?

- A. There is exactly one solution, (2, 3). B. There is exactly one solution, (-60, 120). C. There is no solution to the system of equations. D. There are infinite number of solutions to the system of equations.

- 14 Select two possible values for x in the equation $x^2 = 175$.

- A. $5\sqrt{7}$ B. $5\sqrt{35}$ C. $25\sqrt{7}$ D. $\sqrt{175}$

- 15 Suppose the first equation in a system of two linear equations is $-4x + 13y = -2$. The second equation being which of these will cause the system to have one solution?

- A. $-26x + 8y = -6$ B. $-8x + 26y = -4$ C. $-4x + 13y = -8$ D. $-4x + 13y = -2$

- 16 Which of the following has the greatest value?

- A. 2^{-3} B. 3^{-2} C. $\frac{1}{2^{-3}}$ D. $\frac{1}{3^{-2}}$

17

Directions: Answer the following question(s).

- 18 A cone with a height of 50 meters has a volume of 5400π meters cubed. What is the radius of the cone?

A. 6 m B. 12 m C. 18 m D. 36 m

- 19 Which value is equivalent to $8^3 \cdot 8^7$?

A. 8^{10} B. 8^{21} C. 64^{10} D. 64^{21}

20

- 21 Which of the following ordered pairs satisfy the function $y = -3x + 4$? Select *all* that apply.

A. (4, -8) B. (2, -10) C. (-1, 7) D. (-3, 4)

- 22 The two-way frequency table below shows the relative frequencies for the numbers of days that cars with automatic transmissions and manual transmission sat on a used-car lot before being sold. Which of these statements is true based on the table?

	Automatic Transmission	Manual Transmission	Total
0 – 7 Days	0.06	0.04	0.10
8 – 14 Days	0.13	0.06	0.19
15 – 21 Days	0.13	0.08	0.20
22 – 28 Days	0.14	0.11	0.25
29 – 35 Days	0.03	0.11	0.14
35+ Days	0.06	0.06	0.12
Total	0.54	0.46	1.00

- A. 6% of the cars that sold after more than 35 days had manual transmissions.
 B. 12% of the cars that sold within 15 – 21 days had automatic transmissions.
 C. 40% of the cars that sold within 0 – 7 days had automatic transmissions.
 D. 44% of the cars that sold within 22 – 28 days had manual transmissions.

23

- 24 Select *all* the numbers below that are irrational.

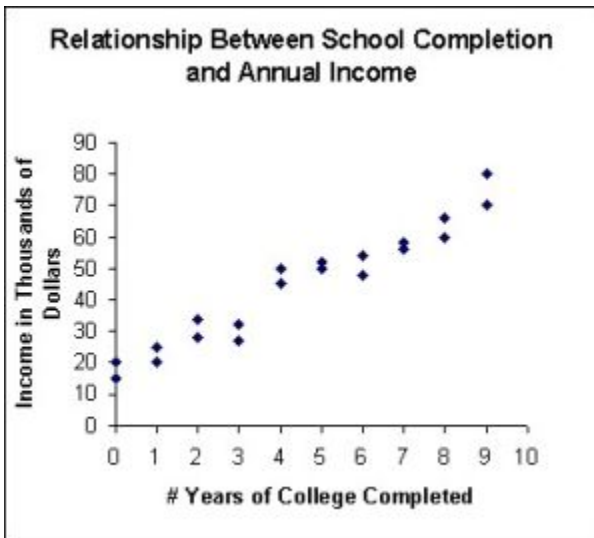
A. 5462.263 B. $\sqrt{19}$ C. $\frac{13}{24}$ D. $\sqrt{61}$
 E. $3.3333\bar{3}$ F. $\sqrt{25}$

Directions: Answer the following question(s).

- 25 Based on the fact that $\sqrt{49} = 7$ and $\sqrt{64} = 8$, which of the following options could be an approximation for $\sqrt{59}$?

A. 6.24 B. 7.68 C. 8.31 D. 9.43

- 26 Which choice BEST describes the relationship between the variables shown in the graph below?



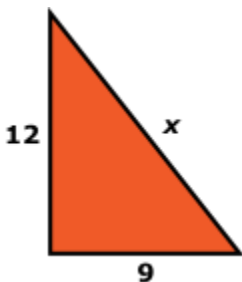
- A. People who completed more years of college generally made less money than those who completed fewer years of college.
- B. There is no relationship between college completion and income.
- C. People should go to college.
- D. People who made more money generally completed more years of college than those who made less money.

- 27 Solve:
 $2(3r + 4) - 3(r + 1) = 11$

A. 0 B. 2 C. 3 D. $\frac{16}{3}$

Directions: Answer the following question(s).

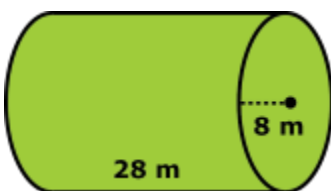
- 28 Find the value of x that makes the triangle a right triangle.



- A. 12 B. 13 C. 15 D. 17

- 29 Which of the following is the best approximation of the volume of the cylinder below?

Use 3.14 for π .



- A. 22,507.5 m³ B. 5626.9 m³ C. 1406.7 m³ D. 703.4 m³

- 30 Select *all* relations that are functions.

- A. $2x + y^2 = 5$ B. $7x - 9y = 16$

C.

x	y
0	3
1	1
2	-1
3	-3

D.

x	y
-2	0
2	2
2	4
4	6

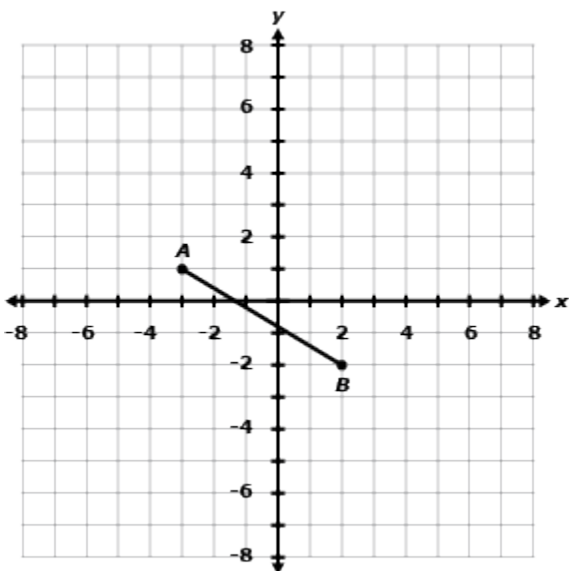
- 31 Simplify and solve:

$$3^2 \times 3^{-3} \times 3^{-1}$$

- A. $\frac{1}{9}$ B. $\frac{1}{729}$ C. 9 D. 729

Directions: Answer the following question(s).

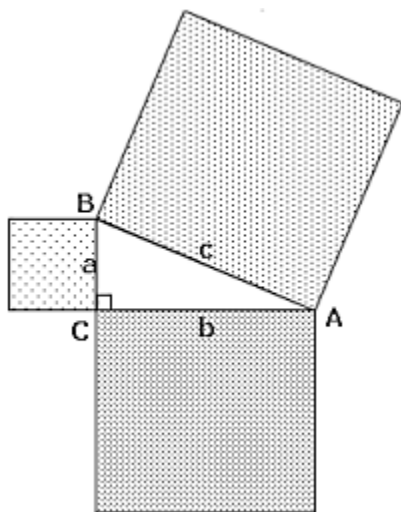
- 32 Which set of coordinates demonstrate a translation of line $\overline{AB}$ up 3 units and left 1 unit?



- A. $(4, -2), (1, 3)$ B. $(-4, 4), (1, 1)$ C. $(-2, 4), (3, 1)$ D. $(4, -4), (1, 1)$

Directions: Answer the following question(s).

33



Given: $\triangle ABC$ is a right triangle

There are 3 shaded squares with sides a , b , and c , respectively.

a , b , and c are also the lengths of the sides of the right triangle, such that the area of the square with side a is a^2 and the area of the square with side b is b^2 and the area of the square with side c is c^2 .

Prove: $a^2 + b^2 = c^2$ (Pythagorean Theorem)

Proving which of the following will prove the Pythagorean Theorem?

- A. When you subtract the area of the smallest square from the medium square the difference equals the area of the largest square.
- B. The sides of a right triangle are also the sides of squares.
- C. $m\angle A + m\angle B = m\angle C$
- D. The area of the two smaller squares will add up to the area of the largest square.

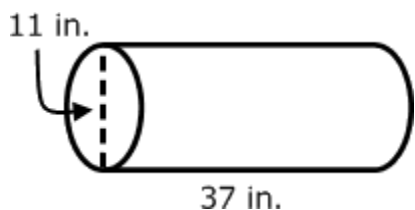
34

The given formula can be used to determine the volume (V) of a cylinder.

$$V = Bh = \text{area of base} \times \text{height}$$

Which of the following is the best approximation of the volume of the cylinder below?

Use 3.14 for π .

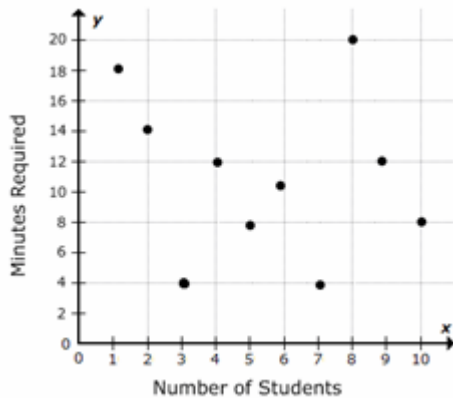


- A. $15,059 \text{ in}^3$
- B. $14,058 \text{ in}^3$
- C. $3,514 \text{ in}^3$
- D. $1,278 \text{ in}^3$

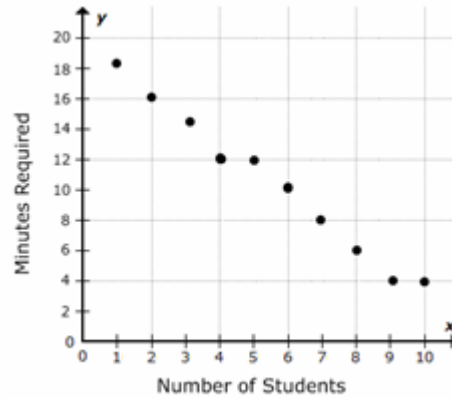
Directions: Answer the following question(s).

35 Which scatter plot shows a positive correlation?

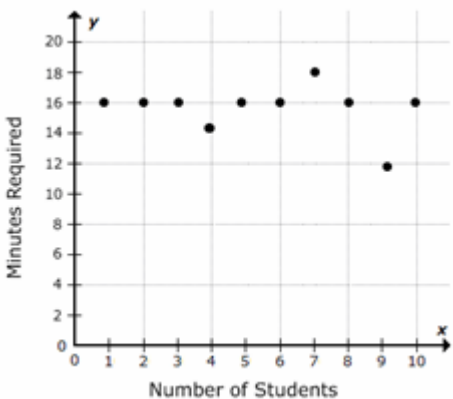
A.



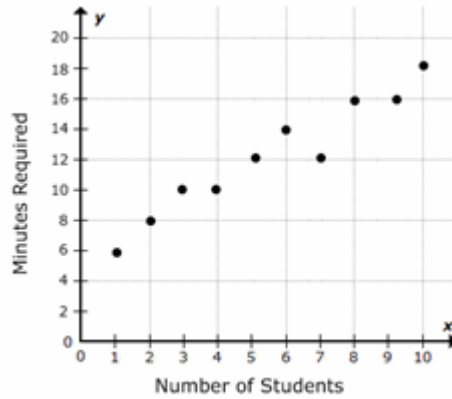
C.



B.



D.



36 A hot air balloon was flying at an altitude of 300 meters when the pilot decided to land by descending at a rate of 2 meters per second. For which of these functions does y represent the altitude of the hot air balloon if x represents the number of seconds since the pilot started her landing?

A. $y = -2x - 300$

B. $y = -2x + 300$

C. $y = 2x - 300$

D. $y = 2x + 300$

Directions: Answer the following question(s).

- 37 The two-way frequency table below shows the relative frequencies for the numbers of freshmen, sophomores, juniors, and seniors at a high school who have a part-time job. Which of these statements is true based on the table?

	Part-Time Job	No Part-Time Job	Total
Freshmen	0.04	0.18	0.22
Sophomores	0.08	0.18	0.26
Juniors	0.12	0.14	0.26
Seniors	0.16	0.10	0.26
Total	0.40	0.60	1.00

- A. 4% of the students who have a part-time job are freshmen.
 B. 10% of the students who don't have a part-time job are seniors.
 C. 20% of the students who have a part-time job are sophomores.
 D. 30% of the students who don't have a part-time job are juniors.
- 38 What is the volume of a spherical water balloon with a radius of 6 inches?
- A. $48\pi \text{ in}^3$ B. $144\pi \text{ in}^3$ C. $288\pi \text{ in}^3$ D. $864\pi \text{ in}^3$
- 39 How many times larger is 5×10^6 than 5×10^2 ?
- A. 125 B. 625 C. 1000 D. 10,000
- 40 Which of the following statements is true about an approximation for $\sqrt{77}$?
- A. It should be to the left of 9 on a number line, since $\sqrt{77}$ is less than $\sqrt{81}$, which is equal to 9.
 B. It should be to the left of 9 on a number line, since $\sqrt{77}$ is greater than $\sqrt{81}$, which is equal to 9.
 C. It should be to the right of 9 on a number line, since $\sqrt{77}$ is less than $\sqrt{81}$, which is equal to 9.
 D. It should be to the right of 9 on a number line, since $\sqrt{77}$ is greater than $\sqrt{81}$, which is equal to 9.
- 41 Which value is equivalent to 4^{-3} ?
- A. -64 B. -12 C. $-\frac{1}{64}$ D. $\frac{1}{64}$
- 42 Alana plotted 20 points on a scatter plot to investigate the relationship between two quantitative variables. She then used the line $y = 3x + 4$ to model the relationship. The line she used is a very good fit. Which of these scenarios is *most* likely?
- A. There are 15 points above the line and 5 points below the line.
 B. There are 6 points above the line and 14 points below the line.
 C. There are 20 points above the line and 0 points below the line.
 D. There are 10 points above the line and 10 points below the line.