

# Section 2

Key

31. Which equation has a constant of proportionality of 3.5?

- A  $y = -3.5x$
- B  $y = x + 3.5$
- C  $y = 3.5x$
- D  $3.5y = x$

$$y = kx$$

$$\downarrow$$

$$y = 3.5x$$

$k = \text{constant}$

32. A computerized cash register calculates the final amount due (cost of items plus sales tax) by multiplying the total cost of the items purchased by 1.075. This fact means that sales tax is how much?

- A 0.075%
- B 0.75%
- C 7.5%
- D 75%

1. = cost of item

tax .075 →  
or 7.5%

Percent means per 100.

33. Hector starts hiking at an elevation of 360 feet. During his hike, he notes the change in elevation several times, as shown in the table.

Hector's Hike	
Change in Elevation (feet)	
+50	→
-74	→
+140	→
-20	→

360  
+ 50  
-----  
340  
- 74  
-----  
336  
+ 140  
-----  
476  
- 20  
-----  
456

What is Hector's elevation after the last change recorded in the table?

- A 96 feet
- B 284 feet
- C 456 feet
- D 644 feet

GO ON →

34. What is the product of  $\frac{3}{4} \times \frac{6}{9}$ ?

- A  $\frac{1}{4}$
- B  $\frac{1}{2}$
- C  $\frac{9}{13}$
- D  $\frac{9}{8}$

$$\frac{\cancel{3}^1}{4 \times 2} \times \frac{\cancel{6}^2 \cancel{3}}{\cancel{9}^3} = \frac{3}{6} = \boxed{\frac{1}{2}}$$

35. Tam has \$16.58 in her bank account. She spends \$4.69 on school supplies and deposits \$5.00. What is her new balance?

- A \$6.89
- B \$16.89
- C \$17.11
- D \$26.27

$$\begin{array}{r} 16.58 \\ -4.69 \\ \hline 11.89 \\ +5.00 \\ \hline \boxed{\$16.89} \end{array}$$

36. Flora and Rico are comparing the length of words in their fifth and seventh grade history books. Each picks a random sample of words from their books and counts the letters in the words. The data they collect is shown in the table.

Length of Words in History Books

Flora's Fifth Grade Book	Rico's Seventh Grade Book
<u>7</u> , 4, <u>2</u> , 8, <u>6</u> , 4, 4, 8, <u>6</u> , 2	<u>6</u> , 9, <u>3</u> , 11, 10, <u>2</u> , <u>2</u> , <u>7</u> , <u>5</u> , 4

$$5.1 = \frac{51}{10}$$

2, 2, 4, 4, 4, 6, 6, 7, 8, 8

2, 2, 3, 4, 5, 6, 7, 9, 10, 11

$$\frac{59}{10} = 5.9$$

Which statement is TRUE?

- A The length of words in both books is the same <sup>NO</sup> because the medians are the same.
- B The length of words in Rico's book is greater than in Flora's book because the mean and range of the data Rico collects is greater than the mean and range of the data Flora collects.
- C <sup>\* both below mean</sup> The length of words in Flora's book is greater than in Rico's book because the mode of the data Flora collects is greater than the mode of the data Rico collects.
- <sup>NO</sup> D The length of words in Flora's book is greater than in Rico's book because the range of the data Flora collects is greater than the range of the data Rico collects.

	Flora	Rico
Med.	5	5.5
Range	6	9
Mode	4	2
mean	5.1	5.9



37. A scale drawing of a rectangular field has a length of 4.5 inches and a width of 3 inches. If the scale is 0.5 inch : 10 feet, what is the actual width of the field?

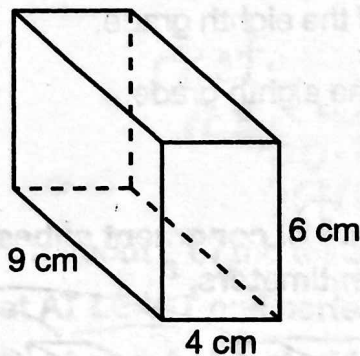
A 6 feet  
 B 15 feet  
 C 30 feet  
 (D) 60 feet

Scale  $\frac{0.5 \text{ in}}{10 \text{ ft}}$   $\frac{3 \text{ in}}{x \text{ feet}}$   $\frac{4.5 \text{ in}}{3 \text{ in}} = \frac{10 \text{ ft}}{x}$

$\frac{30}{.5} = \frac{.5x}{.5}$

$60 = x$

38. Michelle has a jewelry box shaped like a rectangular prism as shown. She wants to cover it in decorative paper.



$l = 9 \text{ cm}$   
 $w = 4 \text{ cm}$   
 $h = 6 \text{ cm}$

What is the area, in square centimeters, that she will cover, with no gaps or overlaps?

- A 42 square centimeters  
 B 114 square centimeters  
 C 216 square centimeters  
 (D) 228 square centimeters

$SA = 2lw + 2lh + 2wh$   
 $2 \cdot 9 \cdot 4 + 2 \cdot 9 \cdot 6 + 2 \cdot 4 \cdot 6$   
 $72 + 108 + 48$

$228 \text{ cm}^2$

$r = \text{rolls}$        $r + 5$        $4(r + 5)$

39. The vegetables had to cook 5 minutes longer than the rolls. The meat had to cook 4 times as long as the vegetables. The meat had to cook for 1 hour. Which equation would you solve to find the number of MINUTES the rolls had to cook?

- A  $x + 4(5) = 60$       C  $4x + 5 = 60$   
 (B)  $4(x + 5) = 60$       D  $x + 5 = 60(4)$



40. The seventh and eighth grades challenge each other during several fundraisers. The amount of money raised by each grade in their fundraisers is recorded in the table.

Amounts Raised in Dollars

Seventh Grade <i>med 60</i>	Eighth Grade <i>med 72</i>
56, 74, 38, 62, 58, 60, 60	90, 42, 58, 88, 62, 72, 84

*IQR 62/56/6*      *IQR 88/58/30*

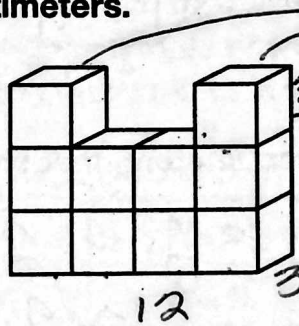
*38, 56, 58, 60, 60, 62, 74*      *42, 58, 62, 72, 84, 88, 90*

Which is TRUE about the difference in the medians?

- 2(6) = 12*
- 5.6 = 3*
- 2.5.30 = 75*
- 1/3.30 = 10*
- A It is twice the IQR of the seventh grade.
- B It is 0.5 times the IQR of the seventh grade.
- C It is 2.5 times the IQR of the eighth grade.
- D It is  $\frac{1}{3}$  times the IQR of the eighth grade.

*Med. 72*  
*Difference - 60*  
*↳ 12*

41. The object shown is made up of congruent cubes glued together. The length of each edge of a cube is 3 centimeters.



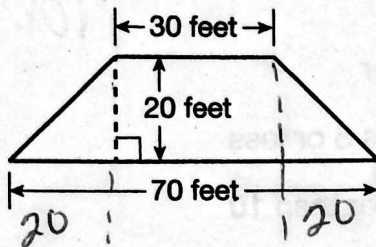
*2.3.3.3 = 54*  
*V = lwh*  
*12.3.6 = 216*  
*270 cm³*

What is the volume of the object in cubic centimeters?

- A 27 cubic centimeters
- B 30 cubic centimeters
- C 216 cubic centimeters
- D 270 cubic centimeters

GO ON

42. Talia makes a drawing of the stage at her school. The stage has the dimensions shown.



What area, in square feet, does the stage have?

- A 400 square feet
- B 800 square feet
- C 1000 square feet**
- D 2000 square feet

Area Trap.  
 Area 2  $\Delta$ 's  
 $2 \cdot \frac{1}{2} bh$   
 $2 \cdot \frac{1}{2} 20ft \cdot 20ft$   
 $1 \cdot 20 \cdot 20$   
 $2 \Delta$ 's =  $400 ft^2$   
 $7600 ft^2$   
 $1000 ft^2$

rect.  
 $A = lw$   
 $30 \cdot 20$   
 $600 ft^2$

43. Robin makes a perfect score on about  $\frac{2}{3}$  of the tests she takes. She estimates the probability that she will get AT LEAST one perfect score on her next two tests using a simulation by rolling number cubes with sides 1 to 6.

She assigns the numbers 1, 2, 3, and 4 to represent perfect scores and the numbers 5 and 6 to represent not getting a perfect score. Her simulated results are shown below.

$\overset{1}{5}, \overset{1}{3}$	$\overset{1}{5}, \overset{1}{2}$	$\overset{1}{4}, \overset{1}{3}$	$\overset{1}{2}, \overset{1}{3}$	$\overset{1}{1}, \overset{1}{2}$	<del><math>\overset{1}{5}, \overset{1}{6}</math></del> perfect	<del><math>\overset{1}{5}, \overset{1}{6}</math></del>
$\overset{1}{4}, \overset{1}{2}$	$\overset{1}{4}, \overset{1}{4}$	$\overset{1}{5}, \overset{1}{6}$ NO	$\overset{1}{4}, \overset{1}{5}$	$\overset{1}{6}, \overset{1}{1}$		

Based on the simulation, what is the probability that Robin will get AT LEAST one perfect score on her next two tests?

- A  $\frac{1}{10}$
- B  $\frac{2}{5}$
- C  $\frac{9}{10}$**
- D 1

$\frac{9}{10}$  = Perfect score

Probability

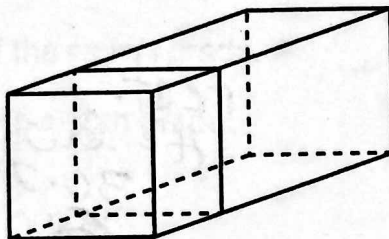


44. Jonathon spins a spinner that has the numbers 1 to 8. Which outcome is impossible?

- A landing on a 5  
B landing on an even number  
C landing on a number that is 8 or less  
D landing on a number greater than 10

Probability

45. A block of cheese is in the shape of a right rectangular prism that has a square base. Joe cuts the block of cheese parallel to the base as shown.



Which describes the cross-section of the cheese where Joe cuts it?

- A a square  
B a triangle  
C a rectangle that is not a square  
D a parallelogram that is not a rectangle

GO ON 

46. Which expression is equivalent to  $-14 \div 2$ ?

A  $-14 \div -2$

B  $14 \div -2$

C  $14 \div 2$

D  $2 \div -14$

47. Two-ninths of the students at Keeler Junior High are in the band. There are 56 students in the band. Which equation would you use to find the TOTAL number of students  $s$  at the school?

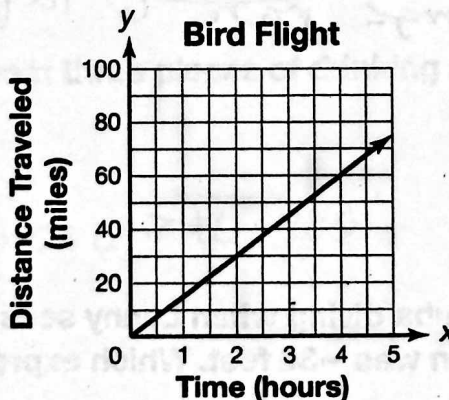
A  $s \div \frac{2}{9} = 56$

C  $\frac{2}{9} \times 56 = s$

B  $\frac{2}{9} \div s = 56$

D  $56 = \frac{2}{9} \times s$

48. The graph below shows the distance that a bird flies over time.



What does the point  $(4, 60)$  mean?

A The bird flies at 60 miles per hour for 4 hours.

B The bird flies 4 miles per hour for 60 miles.

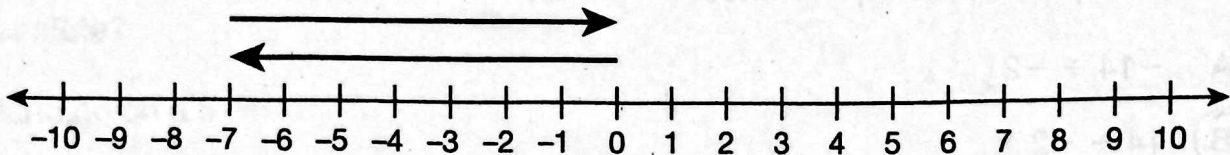
C The bird flies for 240 miles.

D The bird flies 60 miles in 4 hours.

*use x + y axis to give the ordered pair meaning.*

**GO ON**

49. What conclusion can you draw from the number line?



- A** When you add opposite numbers, the sum is 0.
- B** Adding a negative number to 0 and subtracting a negative number from 0 give the same result.  $0 + -8 = -8$        $0 - -8 = 8$
- C** When you multiply numbers with opposite signs, the product is 0. *always neg*
- D** Subtracting a number from its opposite gives a difference of 0. *example*  
 $\boxed{-7} - \boxed{7} = -14$

50. George ran  $2\frac{1}{4}$  laps more than Jon. George ran 6 laps in all. Which equation would you use to find the number of laps  $r$  Jon ran?

$r = \# \text{ lap Jon ran}$

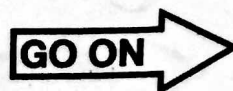
- A**  $2\frac{1}{4} \times r = 6$
- B**  $2\frac{1}{4} + r = 6$
- C**  $2\frac{1}{4} - r = 6$
- D**  $2\frac{1}{4} \div r = 6$

$George = r + 2\frac{1}{4} = 6$   
*George ran 6 laps*

51. Katy and Lenny were scuba diving when Lenny sees a shark. His elevation was  $-42$  feet. Katy's elevation was  $-36$  feet. Which expression represents the distance between them?

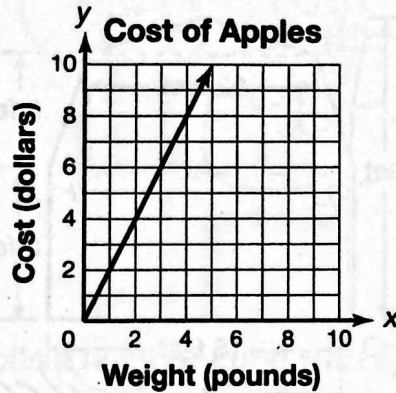
- A**  $-42 + (-36)$
- B**  $-42 - (-36)$
- C**  $-36 + (-42)$
- D**  $|-42 - (-36)|$

$\uparrow$   
 difference





52. The graph below shows the cost that Hondo pays for apples.



What does the point (0, 0) on this graph mean?

- A The cost of apples is \$0 per pound.
  - B There are no apples for Hondo to buy.
  - C When Hondo doesn't buy any apples, he does not have to pay anything.
  - D Hondo doesn't have to pay for the apples.
53. Frank builds a triangle from three pieces of drinking straws. Which lengths of straw could he use?

A 3 cm, 8 cm, 4 cm

B 10 cm, 5 cm, 6 cm

C 1 cm, 4 cm, 5 cm

D 7 cm, 14 cm, 6 cm

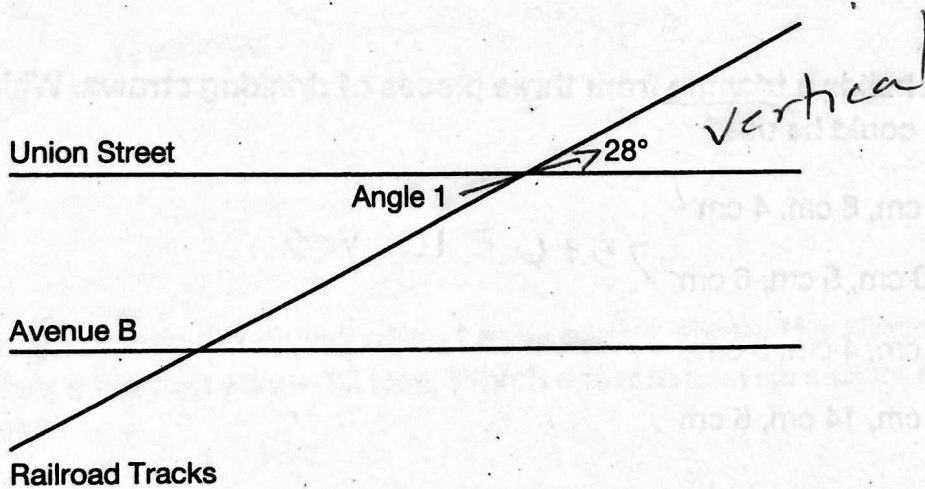
$\rightarrow 5 + 6 > 10$  YES

54. Dexter paints the side of a shed at a community garden. The diagram shows the dimensions of the side that Dexter paints.

$\triangle \frac{1}{2}bh$   
 $\frac{1}{2} = 12 \cdot 2$   
 $6 \cdot 2 = 12ft^2$   
 $\rightarrow 4's \frac{2 \cdot \frac{1}{2} \cdot 2 \cdot 6}{2} = 12$   
 $1st \square A = lw$   
 $12 \cdot 6 = 72ft^2$   
 $2nd \square 16 \cdot 8 = 128ft^2$   
 $\rightarrow Added = 224ft^2$

What area, in square feet, does Dexter paint?

- A 212 square feet  
 B 224 square feet  
 C 236 square feet  
 D 256 square feet
55. Union Street and Avenue B run parallel to each other. The railroad tracks cross Union Street at the angle shown.



What is the measure of Angle 1?

- A  $28^\circ$  because it is a vertical angle with the given angle  
 B  $62^\circ$  because it is complementary to the given angle  
 C  $152^\circ$  because it is supplementary to the given angle  
 D  $180^\circ$  because it is a straight angle

GO ON

56. Which expression is equivalent to  $14.8 - 4b - (17.1 - 3b)$ ?

A  $2.3 - 7b$

B  $-2.3 + b$

C  $-2.3 - b$

D  $2.3 + 7b$

$$\begin{array}{r} 14.8 - 4b - (17.1 - 3b) \\ \phantom{14.8} + -4b + -17.1 + 3b \\ \hline -b - 2.3 \end{array}$$

Handwritten work for question 56 showing the distribution of terms and a vertical subtraction:

$$\begin{array}{r} 17.1 \\ -14.8 \\ \hline 2.3 \end{array}$$

57. Hank tosses a coin and rolls a number cube with sides numbered 1 to 6.

Which expression can he use to calculate the probability of the outcome heads and a number less than 3?

A  $\frac{1}{3} \times \frac{1}{2}$

B  $\frac{1}{2} \times \frac{1}{2}$

C  $\frac{1}{2} \times \frac{1}{3}$

D  $\frac{1}{4} \times \frac{1}{2}$

Probability  
 $P(\text{heads}, < 3)$   
 $\frac{1}{2} \cdot \frac{1}{3}$


58. Talia wants to find out if the students at her school would like to have a monthly student-run newspaper. Which survey will result in a random sample?

A She asks each student in her homeroom.

B She asks all seventh graders in the school.

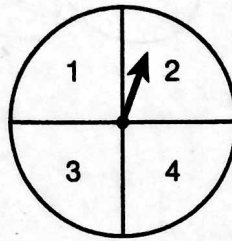
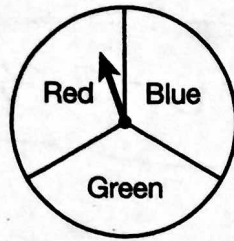
C She picks 50 names at random, sends surveys, and scores those that return.

D She picks every eighth student that enters the school cafeteria on Wednesday.

GO ON 

59. James has the spinners shown below. He makes the table to show the possible outcomes of spinning each spinner once.

Probability



Outcomes of Two Spinners

	1	2	3	4
Red	R-1	R-2	R-3	R-4
Blue	B-1	B-2	B-3	B-4
Green	G-1	G-2	G-3	G-4

What is the probability that the first spinner will land on green and the second will land on an odd number?

- A  $\frac{1}{6}$   
 B  $\frac{1}{3}$   
 C  $\frac{2}{3}$   
 D  $\frac{5}{6}$

$$P(G, \text{odd}) = \frac{2}{12} = \frac{1}{6}$$

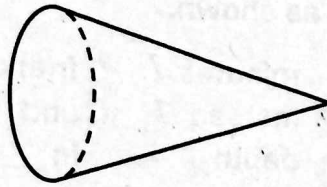
60. On Monday, Hailey spends \$14. After babysitting she is paid \$14. What conclusion can you draw?

- A The amounts cannot be compared since the amount of money she had to start is unknown.  
 B She has the same amount of money she had to start because  $14 + (-14) = 0$ .  
 C She has more money that she had to start because  $14 + 14 = 28$ .  
 D She has less money than she had to start because  $-14 + (-14) = -28$ .

GO ON

Unauthorized copying or reuse of any part of this page is prohibited by law.

61. The tip of a tube of glue is in the shape of a cone, as shown.



If Basma cuts the tip parallel to the base, which describes the cross-section?

- A an equilateral triangle  
B an isosceles triangle  
C a circle  
D an oval
62. Which of the following is NOT a rational number?

- A  $\frac{4}{9}$   
B 3.03  
C 2.02020202...

- D 1.01001000100001...

Not repeating  
nor terminating decimal!

Rational  $\frac{a}{b}$  fraction

Decimal - terminate  
repeats

GO ON 

63. Hee Sun wants to estimate the average word length in a book. She randomly chooses 20 words in the book, as shown.

$\frac{104}{20} = 5.2$   
 receiver 8    there 5    minutes 7    friendly 8    advanced 8  
 towards 7    the 3    instead 7    and 3    no 2  
 suspense 8    so 2    depth 5    in 2    lonely 6  
 sighed 6    what 4    was 3    answered 8    of 2

Based on this sample, which is the BEST estimate of the mean word length in the book?

- A 5
- B 6
- C 7
- D 8

64. The table shows the results of drawing one marble from a bag of marbles.

*Probability*

Drawing a Marble

Result	Frequency
Blue	4
Red	14
Green	20
Yellow	12

What is the probability of drawing a yellow marble?

- A 0.12
- B 0.24
- C 0.25
- D 0.76

