16. If $x + y = 26$ and $x - y = 14$, then $y = ?$

F. 6
G. 7
H. 12
J. 20
K. 40

DO YOUR FIGURING HERE.

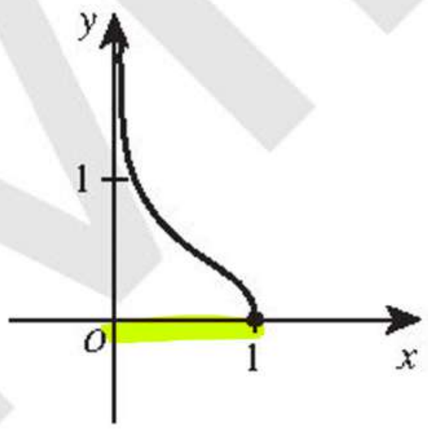
17. The chart below shows the possible combinations of numbers that can land faceup when 2 numbered cubes are rolled at the same time. Each combination is equally likely.

	1	2	3	4	5	6
1	(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)
2	(2,1)	(2,2)	(2,3)	(2,4)	(2,5)	(2,6)
3	(3,1)	(3,2)	(3,3)	(3,4)	(3,5)	(3,6)
4	(4,1)	(4,2)	(4,3)	(4,4)	(4,5)	(4,6)
5	(5,1)	(5,2)	(5,3)	(5,4)	(5,5)	(5,6)
6	(6,1)	(6,2)	(6,3)	(6,4)	(6,5)	(6,6)

What is the probability of rolling the numbered cubes so that the sum of the numbers that land faceup is 8 or greater?

A. $\frac{5}{12}$
B. $\frac{5}{18}$
C. $\frac{5}{36}$
D. $\frac{13}{18}$
E. 0

18. The graph of the function $y = \sqrt{-\log_{10} x}$ is shown in the standard (x,y) coordinate plane below. The function is defined for values of x strictly between which of the following pairs of numbers?



F. −10 and −1
G. −1 and 0
H. 0 and 1
J. 1 and 10
K. 10 and 100

19. To increase the mean of 7 numbers by 3, by how much would the sum of the 7 numbers have to increase?

A. 3
B. 7
C. 10
D. 21
E. 42

DO YOUR FIGURING HERE.

↑ Mean = ↑ Sum / no.

3 = Sum / 7

7 × 3

21

20. In the standard (x,y) coordinate plane, the line with equation $y + 1 = \frac{3}{4}(2x + 8)$ has a slope of:

F. $\frac{3}{4}$
G. $\frac{3}{2}$
H. 2
J. 5
K. 6

$y + 1 = \frac{3}{2}x + 6$

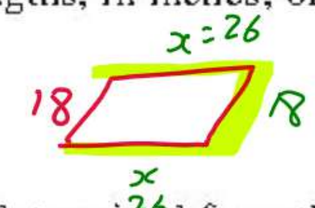
$y = \frac{3}{2}x + 5$

$\frac{y-y}{x-x}$

$y = mx + b$

21. A parallelogram has a perimeter of 88 inches, and 1 of its sides measures 18 inches. If it can be determined, what are the lengths, in inches, of the other 3 sides?

A. 18, 18, 34
B. 18, 17, 17
C. 18, 26, 26
D. 18, 35, 35
E. Cannot be determined from the given information



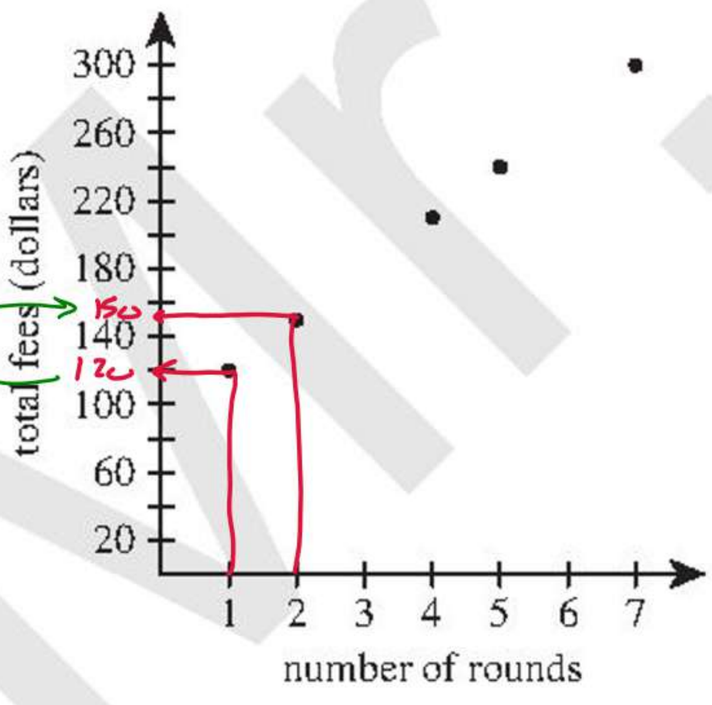
$18 + 18 + x + x = 88$

shift

solve

$2x = 26$

22. Five friends play golf at a course that charges both an annual membership fee and a fee to play each round. Each point on the scatterplot below represents the number of rounds each person played during a year and the total fees the golf course charged that person.



One of the following values is the fee to play each round. Which one?

F. $ 0.75
G. $ 30.00
H. $ 53.68
J. $ 90.00
K. $300.00

DO YOUR FIGURING HERE.

1 yard = 3 ft
1 ft = 12 inches

23. Tomás wants to tile a rectangular floor with square tiles that measure 12 inches on a side. The floor measures 10 feet 6 inches long by 8 feet 6 inches wide. If he is able to cut the tiles without waste, what is the minimum whole number of tiles Tomás needs to completely cover the floor?

89

A. 80
B. 90
C. 98
D. 99
E. 100

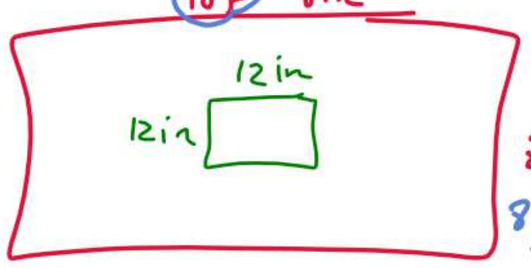
A. big / A. small = 126×102 / 12×12 = 89.25

10×12+6 = 126

10 ft 6 in

8×12+6 = 102

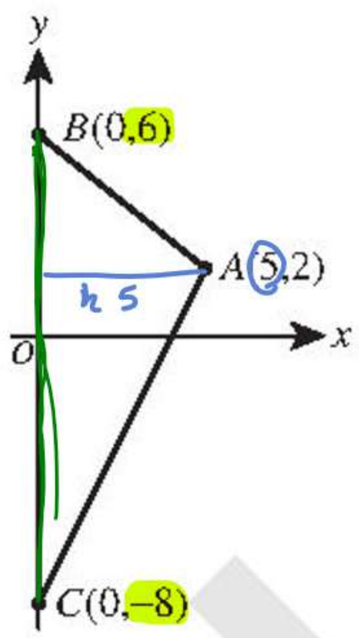
8 ft 6 in



24. In the standard (x,y) coordinate plane below, $\triangle ABC$ is bounded by $\overline{AB}$, $\overline{AC}$, and the y-axis. Which of the following values is closest to the area, in square coordinate units, of $\triangle ABC$?

A△ = ½ b·h
= ½ (14)(5)
= 35

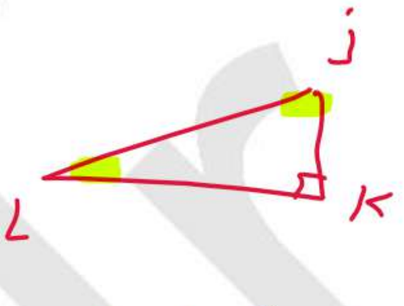
6 − (−8)
= 14



F. 15.8
G. 31.6
H. 35.0
J. 70.0
K. 79.1

25. In right triangle $\triangle JKL$, the right angle is at K, the length of $\overline{JK}$ is 10 cm, and $\sin L = \frac{5}{11}$. What is the value of $\cos J$?

A. $\frac{5}{11}$
B. $\frac{6}{11}$
C. $\frac{5}{\sqrt{96}}$
D. $\frac{6}{\sqrt{96}}$
E. $\frac{5}{\sqrt{146}}$



L + J = 90 ⟷ sin L = Cos J

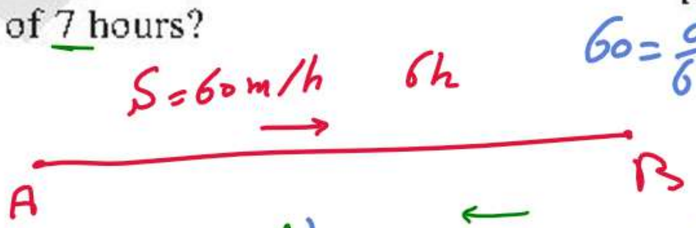
26. John averages 60 miles per hour (mph) the 6 hours he travels from his house to Ling's house. On his return trip, John experiences heavy traffic due to construction zones. He averages 36 mph the first 3 hours of his return trip. What is the average speed, in miles per hour, John must drive for the rest of the return trip for a return trip of 7 hours?

$S = \frac{d}{t}$

$60 = \frac{d}{6}$ $d = 6 \times 60 = 360$

F. 42
G. 48
H. 54
J. 63
K. 66

S = 60 m/h, 6 h



d 360 − 108 = 252

$S = \frac{252}{4} = 63$

t = 7 − 3 = 4 h

S = ??

S = 36
t = 3 h

$36 = \frac{d}{3}$

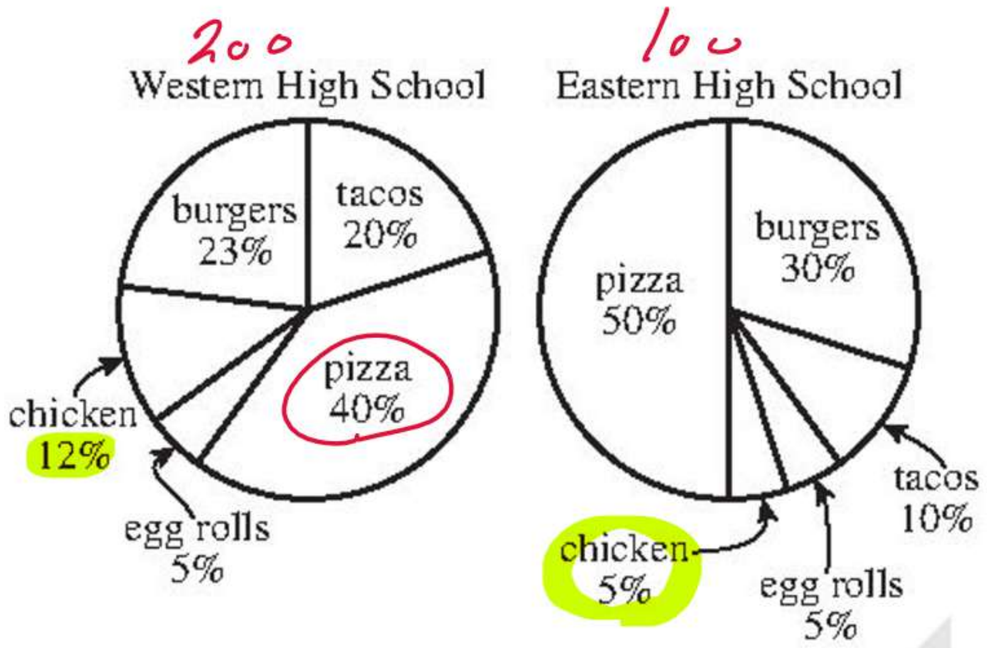
d = 36 × 3 = 108

GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

Use the following information to answer questions 27–29.

At Western High School and Eastern High School, 200 students and 100 students, respectively, were surveyed to determine their fast-food preferences. Each of the 300 students indicated 1 preference among 5 choices, as summarized in the pie charts below.



(Note: Each pie chart is made up of sectors that are proportional in size to the percent of students they represent.)

27. How many students surveyed at Western High School indicated chicken as their preference?

A. 12
B. 17
C. 24
D. 36
E. 40

12% x 200 =

28. What is the measure, to the nearest 1°, of the central angle of the sector that represents the number of students at Western High School who indicated pizza as their preference?

F. 40°
G. 80°
H. 108°
J. 120°
K. 144°

40% x 360

= 144

DO YOUR FIGURING HERE.

29. The same survey was taken at Central High School. The percent of students at Eastern High School who indicated chicken as their preference was 1 more than $\frac{1}{2}$ the percent of students at Central High School who indicated chicken as their preference. What percent of students at Central High School indicated chicken as their preference?

A. 3%
B. 4%
C. 8%
D. 9%
E. 12%

$E = 1 + \frac{1}{2}C$

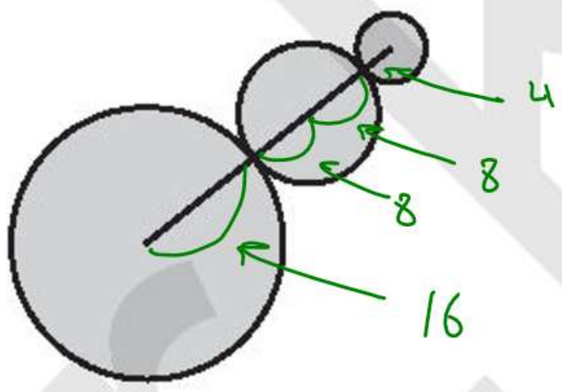
$5 = 1 + \frac{1}{2}C$

shift solve

$C = 8$

30. Jermaine will build a metal wall sculpture that is composed of 3 circles of different sizes, shown below. The smallest circle will have a diameter of 8 inches, and the diameters of the 3 circles will be in the ratio of 1:2:4. To reinforce the sculpture, Jermaine will place a straight metal bar from the center of the smallest circle, through the center of the middle circle, to the center of the largest circle. What will be the length, in inches, of the bar?

F. 28
G. 36
H. 56
J. 64
K. 72



$r = 4$

$4 + 8 + 8 + 16$
$= 36$

31. Juan will flip a fair 2-sided coin and spin a wheel. The coin has 1 heads side and 1 tails side. The wheel has an equal chance of stopping on any one of its 4 sections: red, blue, yellow, and green. What is the probability that the coin lands tails side up and the wheel stops on the green section?

A. $\frac{1}{8}$
B. $\frac{1}{6}$
C. $\frac{1}{3}$
D. $\frac{1}{2}$
E. $\frac{3}{4}$

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

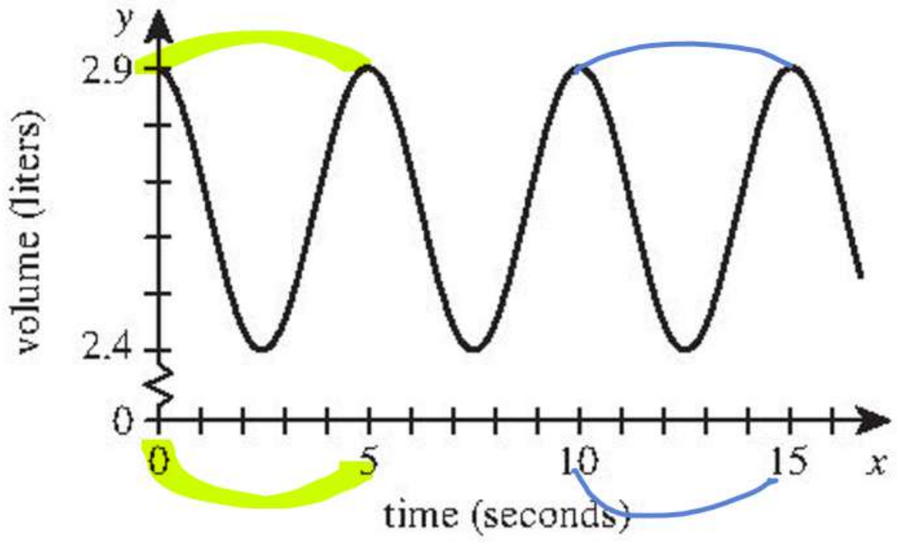
and
×

or
+

GO ON TO THE NEXT PAGE.

32. The volume of air, in liters, in the lungs of an average person during normal breathing is a function of time, in seconds. This function is modeled by the sine function graphed in the standard (x,y) coordinate plane below. One of the following values is the period, in seconds, of this function. Which one?

DO YOUR FIGURING HERE.



F. 0.5
G. 2.4
H. 2.5
J. 2.9
K. 5.0

33. If $f(x) = 5^x$ and $g(x) = -2$, then $-f(g(x)) = ?$

A. -25

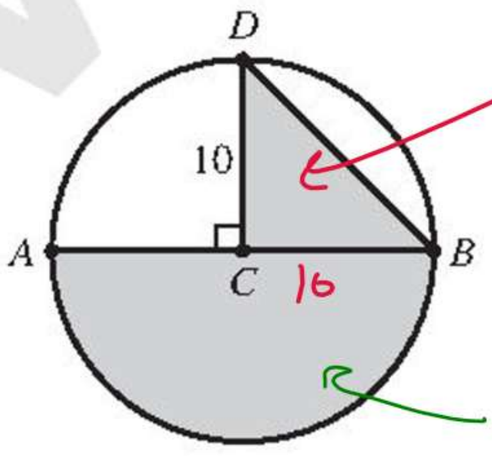
B. $-\sqrt{5}$

C. $-\frac{1}{25}$

D. 2

E. 25

34. In the circle shown below, C is the center, $\overline{AB}$ is a diameter, and $\overline{CD}$ is a radius of length 10 inches that is perpendicular to $\overline{AB}$. Which of the following values is closest to the area, in square inches, of the shaded region (the combined area of the semicircle and $\triangle BCD$) ?



F. 150
G. 186
H. 207
J. 236
K. 264

$A\Delta = \frac{1}{2} b \cdot h$

$\frac{1}{2}(10)(10) = 50$

$\frac{\pi r^2}{2} = \frac{\pi(10)^2}{2}$

$= 157$

$50 + 157$