

1. A car averages 27 miles per gallon. If gas costs \$4.04 per gallon, which of the following is closest to how much the gas would cost for this car to travel 2,727 typical miles?

A. \$44.44

B. \$109.08

C. \$118.80

D. \$408.04

E. \$444.40

2. When $x = 3$ and $y = 5$, by how much does the value of $3x^2 - 2y$ exceed the value of $2x^2 - 3y$?

F. 4

G. 14

H. 16

I. 20

J. 50

3. What is the value of x when $2x + 3 = 3x - 4$?

A. -7

B. $-\frac{1}{5}$

C. 1

D. $\frac{1}{5}$

E. 7

4. What is the greatest common factor of 42, 126, and 210 ?

F. 2

G. 6

H. 14

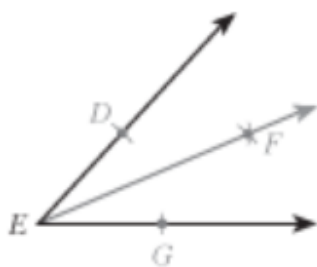
I. 21

J. 42

5. Sales for a business were 3 million dollars more the second year than the first, and sales for the third year were double the sales for the second year. If sales for the third year were 38 million dollars, what were sales, in millions of dollars, for the first year?

- A. 16
- B. 17.5
- C. 20.5
- D. 22
- E. 35

6. In the figure below, ray \overrightarrow{EF} was constructed starting from rays \overrightarrow{ED} and \overrightarrow{EG} . By using a compass D and G were marked equidistant from E on rays \overrightarrow{ED} and \overrightarrow{EG} . The compass was then used to locate a point F , distinct from E , so that F is equidistant from D and G . For all constructions defined by the above steps, the measures of $\angle DEF$ and $\angle GEF$:



- F. are equal.
- G. are NOT equal.
- H. sum to 30° .
- I. sum to 45° .
- J. sum to 60° .

7. Abandoned mines frequently fill with water. Before an abandoned mine can be reopened, the water must be pumped out. The size of pump required depends on the depth of the mine. If pumping out a mine that is D feet deep requires a pump that pumps a minimum of $\frac{D^2}{25} + 4D - 250$ gallons per minute, pumping out a mine that is 150 feet deep would require a pump that pumps a minimum of how many gallons per minute?

- A. 362
- B. 500
- C. 800
- D. 1,250
- E. 1,750

8. The length, in inches, of a box is 3 inches less than twice its width, in inches. Which of the following gives the length, l inches, in terms of the width, w inches, of the box?

F. $l = \frac{1}{2}w + 3$

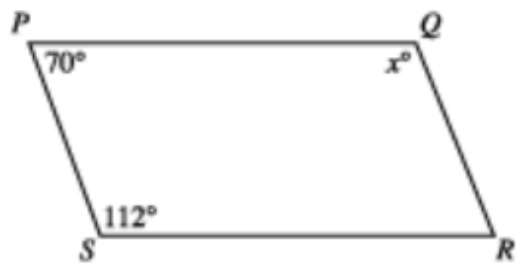
G. $l = w + 3$

H. $l = w - 3$

I. $l = 2w + 3$

J. $l = 2w - 3$

9. In quadrilateral $PQRS$ below, sides \overline{PS} and \overline{QR} are parallel for what value of x ?



- A. 158
- B. 132
- C. 120
- D. 110
- E. 70

10. How many irrational numbers are there between 1 and 6 ?

F. 1

G. 3

H. 4

I. 10

J. Infinitely many

11. A typical high school student consumes 67.5 pounds of sugar per year. As part of a new nutrition plan, each member of a track team plans to lower the sugar he or she consumes by at least 20% for the coming year. Assuming each track member had consumed sugar at the level of a typical high school student and will adhere to this plan for the coming year, what is the maximum number of pounds of sugar to be consumed by each track team member in the coming year?

A. 14

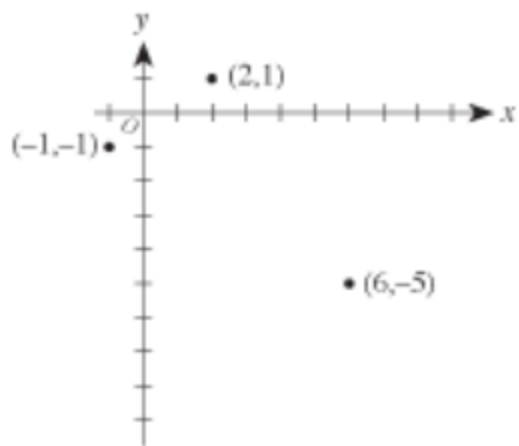
B. 44

C. 48

D. 54

E. 66

12. In the standard (x,y) coordinate plane below, 3 of the vertices of a rectangle are shown. Which of the following is the 4th vertex of the rectangle?



- F. $(3, -7)$
- G. $(4, -8)$
- H. $(5, -1)$
- I. $(8, -3)$
- J. $(9, -3)$

13.

The *lead* of a screw is the distance that the screw advances in a straight line when the screw is turned 1 complete turn. If a screw is $2\frac{1}{2}$ inches long and has a lead of $\frac{1}{8}$ inch, how many complete turns would get it all the way into a piece of wood?

- A. 5
- B. 10
- C. 15
- D. 20
- E. 25

14.

If $xy = 144$, $x + y = 30$, and $x > y$, what is the value of $x - y$?

F. 4

G. 6

H. 18

I. 22

J. 24

15.

Which of the following is the sine of angle A in the right triangle below?



A. $\frac{5}{13}$

B. $\frac{5}{12}$

C. $\frac{12}{13}$

D. $\frac{12}{5}$

E. $\frac{13}{5}$

16.

Ding's Diner advertised this daily lunch special: "Choose 1 item from each column—only \$4.95!" Thus, each daily lunch special consists of a salad, a soup, a sandwich, and a drink.

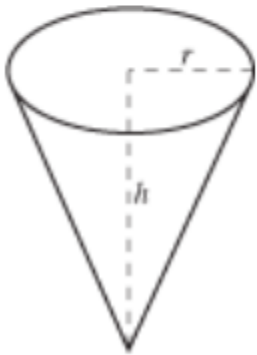
Salads	Soups	Sandwiches	Drinks
cole slaw lettuce potato	onion tomato	meat loaf chicken hamburger ham tenderloin	milk cola coffee tea

How many different daily lunch specials are possible?

- F. 4
- G. 14
- H. 30
- I. 120
- J. 180

17.

The volume, V , of the right circular cone with radius r and height h , shown below, can be found using the formula $V = \frac{1}{3} \pi r^2 h$. A cone-shaped paper cup has a volume of 142 cubic centimeters and a height of 8.5 centimeters. What is the radius, to the nearest centimeter, of the paper cup?



- A. 2
- B. 4
- C. 8
- D. 12
- E. 16

18.

A boat departs Port Isabelle, Texas, traveling to an oil rig. The oil rig is located 9 miles east and 12 miles north of the boat's departure point. About how many miles is the oil rig from the departure point?

F. 3

G. $\sqrt{63}$

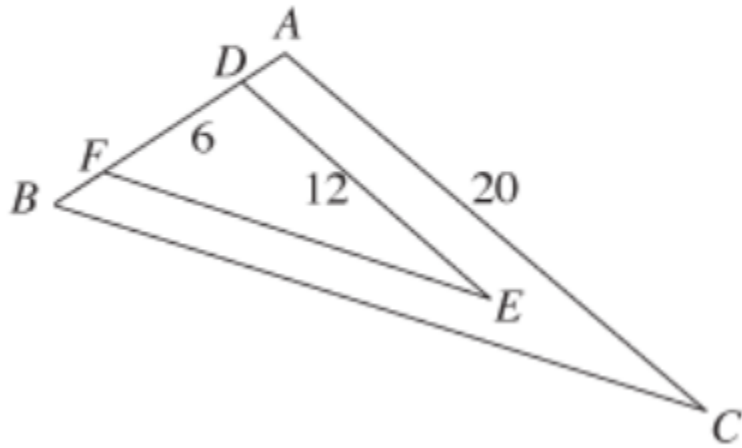
H. 15

I. 21

J. 225

19.

In the figure below, $\angle ABC \cong \angle DFE$, $\angle BAC \cong \angle FDE$, D and F are on \overline{AB} , $\overline{AD} \cong \overline{FB}$, and distances in centimeters are as shown. What is the length of \overline{AD} , in centimeters?



- A. 5
- B. 4
- C. 3
- D. 2
- E. 1

20.

Which of the following is a factor of the polynomial $2x^2 - 3x - 5$?

F. $x - 1$

G. $2x - 3$

H. $2x - 5$

I. $2x + 5$

J. $3x + 5$

21.

What is x , the second term in the geometric series $\frac{1}{4} + x + \frac{1}{36} + \frac{1}{108} + \dots$?

(Note: In a geometric series the ratio of any term to the following term is constant.)

A. $\frac{1}{3}$

B. $\frac{1}{9}$

C. $\frac{1}{12}$

D. $\frac{1}{16}$

E. $\frac{1}{18}$

22.

What is the slope of any line parallel to the line $9x + 4y = 7$?

F. -9

G. $-\frac{9}{4}$

H. $\frac{9}{7}$

I. 7

J. 9

23.

A DVD player with a list price of \$100 is marked down 30%. If John gets an employee discount of 20% off the sale price, how much does John pay for the DVD player ?

- A. \$86.00
- B. \$77.60
- C. \$56.00
- D. \$50.00
- E. \$44.00

23.

$$\sqrt{-(-9)^2} = ?$$

(Note: $i = \sqrt{-1}$)

F. $9i$

G. $9 + i$

H. $9 - i$

I. 9

J. -9