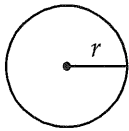




Math Test --- Calculator

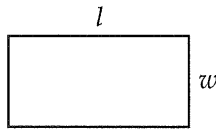
55 Minutes, 38 Questions

Reference

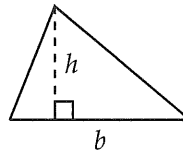


$$A = \pi r^2$$

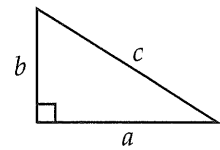
$$C = 2\pi r$$



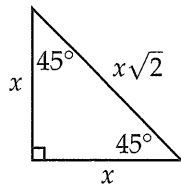
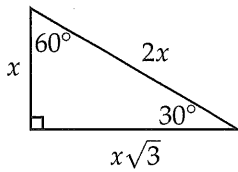
$$A = lw$$



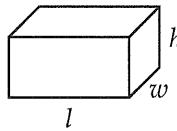
$$A = \frac{1}{2}bh$$



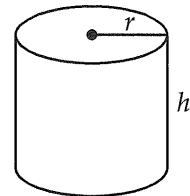
$$c^2 = a^2 + b^2$$



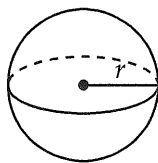
Special Right Triangles



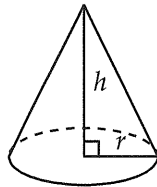
$$V = lwh$$



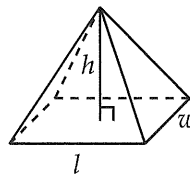
$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}lwh$$

There are 360 degrees of arc in a circle.

There are 2π radians of arc in a circle.

The sum of the measures of the angles of a triangle, in degrees, is 180.

4



4

1

Mon	3,830
Tue	2,960
Wed	2,435
Thu	2,605
Fri	3,860
Sat	5,695
Sun	6,230
Total	27,615

The table above shows the number of visitors to a museum over the course of one week. Based on the table, what is the mean number of visitors each day from Monday to Friday?

- A) 3,138
- B) 3,945
- C) 4,326
- D) 5,523

2

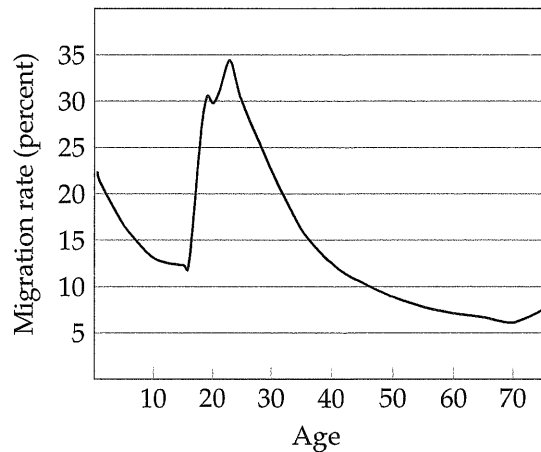
1 mile = 5280 feet
61 centimeters = 2 feet

Based on the information above, how many centimeters are equivalent to 3 miles?

- A) 161,040
- B) 322,080
- C) 483,120
- D) 644,160

3

Age-Specific Migration Rates



The graph above shows how likely people of different ages are to migrate, or move away, from their original home. Which of the following is closest to the age at which the migration rate is highest?

- A) 18
- B) 20
- C) 25
- D) 30

4

Kevin surveyed a random sample of teachers in his district to determine whether new textbooks or new computers are a higher priority for schools. Of the 120 teachers surveyed, 37.5% think new computers are a higher priority. Based on this information, about how many of the 2,200 teachers in the district would be expected to think new textbooks are a higher priority?

- A) 680
- B) 825
- C) 1,200
- D) 1,375

4



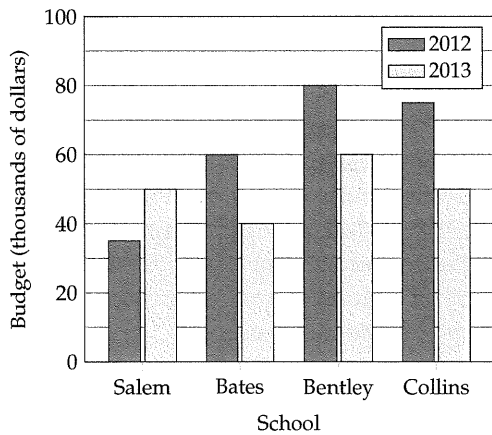
4

5

Which of the following is equivalent to the expression $(1.4x + 2.5)^2 - (1.4x - 2.5)^2$?

- A) 12.5
- B) $7x$
- C) $14x$
- D) $14x + 12.5$

Questions 6-7 refer to the following information.



6

Which of the following schools had a budget in 2013 that was approximately $\frac{2}{3}$ of its budget in 2012?

- I. Bates
 - II. Bentley
 - III. Collins
- A) I only
 - B) I and III only
 - C) II and III only
 - D) I, II, and III

7

From 2012 to 2013, the total budget for all four schools decreased by approximately what percent?

- A) 20%
- B) 25%
- C) 30%
- D) 33%

8

$$f(x) = \begin{cases} x + 2 & \text{if } x \geq 0 \\ x - 2 & \text{if } x < 0 \end{cases}$$

The function f is defined above. Which of the following CANNOT be $f(x)$ for any value of x ?

- A) -6
- B) -4
- C) 1
- D) 3

9

$$x^2 + (y - 3)^2 = 25$$

The graph of the equation above in the xy -plane is a circle. At what points does the circle intersect the y -axis?

- A) $(0, -2)$ and $(0, 8)$
- B) $(0, -3)$ and $(0, 7)$
- C) $(0, -8)$ and $(0, 2)$
- D) $(0, -22)$ and $(0, 28)$

4



4

10

A house is losing a fourth of its value every year. Which of the following best describes the relationship between time (in years) and the value of the house?

- A) Increasing linear
- B) Decreasing linear
- C) Exponential growth
- D) Exponential decay

11

$$y = 2(x + 4)(3x - 18)$$

The equation above represents a parabola in the xy -plane. Which of the following equivalent equations displays the x - and y -coordinates of the vertex of the parabola as constants or coefficients?

- A) $y = 6(x + 4)(x - 6)$
- B) $y = 6x^2 - 12x - 144$
- C) $y = (2x + 8)(3x - 18)$
- D) $y = 6(x - 1)^2 - 150$

12

A restaurant conducted a survey to determine what customers would think about a new sandwich menu item for lunch. During lunch time, the restaurant owner put the sandwich on the menu for 8 dollars and the first 40 customers to buy it were asked for their opinions. Which of the following factors makes it least likely that a reliable conclusion can be drawn about the opinions of all the restaurant's customers concerning the new sandwich menu item?

- A) The sample size
- B) The time the survey was given
- C) The price of the sandwiches
- D) The way the customers were selected for the survey

13

Sam deposits \$800 into an account that earns 4 percent interest each year, compounded semiannually. Which of the following is closest to the total amount in his account after 5 years?

- A) \$971
- B) \$973
- C) \$975
- D) \$977

14

James is traveling to France and needs to exchange 800 U.S. dollars for euros. He looks up the official exchange rate and sees that 1 euro is worth 1.40 U.S. dollars. However, the currency exchange station at the airport is offering 1 euro for 1.55 U.S. dollars. Approximately how many more euros would James have if he converts his money at the official exchange rate rather than at the one offered at the airport?

- A) 50
- B) 55
- C) 60
- D) 65

15

$$f(x) = x^2 - 3x$$

$$g(x) = 2x + 14$$

The functions f and g are defined above. For how many values of k is it true that $f(k) = g(k)$?

- A) None
- B) One
- C) Two
- D) More than two

4



4

16

At a toy store, two dolls and three toy cars cost 88 dollars. However, three dolls and two toy cars cost 62 dollars. How much does one doll and one toy car cost, in dollars?

- A) 28
- B) 30
- C) 32
- D) 34

17

The graph of the function f contains the points $(0, 3)$, $(-2, 7)$, and $(5, k)$. If the graph of f is a line, what must the value of k be?

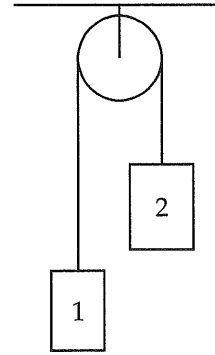
- A) -13
- B) -7
- C) 5
- D) 8

18

A researcher surveyed a random sample of 200 engineers working in Silicon Valley and determined that the mean salary for the engineers has a 95% confidence interval of \$90,000 to \$110,000. Which of the following conclusions is the most reasonable based on the confidence interval?

- A) There is a 95% chance that the true mean salary of all the engineers working in Silicon Valley is between \$90,000 and \$110,000.
- B) There is a 95% chance that the true mean salary of all the engineers working in California is between \$90,000 and \$110,000.
- C) 95% of all the engineers working in Silicon Valley earn a salary between \$90,000 and \$110,000.
- D) There is evidence to suggest that the true mean salary of all the engineers working in Silicon Valley is between \$90,000 and \$110,000.

Questions 19-20 refer to the following information.



In the figure above, two objects are connected by a cord and hung over a pulley. The tension T , in newtons, in the cord can be found using the equation below.

$$T = \frac{2m_1m_2}{m_1 + m_2}g$$

where m_1 and m_2 are the masses of object 1 and object 2, respectively, in kilograms, and g is the acceleration due to Earth's gravity measured in $\frac{\text{m}}{\text{sec}^2}$.

19

Which of the following expresses g in terms of the other variables?

- A) $\frac{T(m_1 + m_2)}{2m_1m_2}$
- B) $\frac{2m_1m_2}{T(m_1 + m_2)}$
- C) $\frac{2(m_1 + m_2)}{Tm_1m_2}$
- D) $T(m_1 + m_2) - 2m_1m_2$