

SATPREP

Assignment – No Calculator

1. Marco is ordering salt, which is only sold in 30-pound bags. He currently has 75 pounds of salt, and he needs to have a minimum of 200 pounds. Which of the following inequalities shows all possible values for the number of bags, b , that Marco needs to order to meet his minimum requirement?

- A. $b \geq 4$
- B. $b \geq 5$
- C. $b \geq 6$
- D. $b \geq 7$

2. A website hopes to sign up 100,000 subscribers. So far, the website has signed up an average of 500 subscribers per day for d days. Which of the following represents the number of additional subscribers, W , the website must sign up to reach its goal?

- A. $W = 500d$
- B. $W = 99,500d$
- C. $W = 100,000 - 500d$
- D. $W = 100,000 + 500d$

3. If f is a function and $f(4) = 5$, which of the following CANNOT be the definition of f ?

- A. $f(x) = x + 1$
- B. $f(x) = 2x - 3$
- C. $f(x) = 3x - 2$
- D. $f(x) = 4x - 11$

4. Which of the following is equivalent to the expression

$$\frac{x^3 + x^2}{x^4 + x^3}?$$

- A. $\frac{x^5}{x^7}$
- B. $\frac{2}{x}$

C. $\frac{5x}{7x}$

D. x^{-1}

5. Régine is measuring how many solutions from Batch x and Batch y are acidic. She measured a total of 100 solutions from both batches. 40% of the solutions from Batch x and 70% of the solutions from Batch y were acidic, for a total of 48 acidic solutions. Solving which of the following systems of equations yields the number of solutions in Batch x and Batch y ?

A. $x + y = 100$

$0.4x + 0.7y = 48$

B. $x + y = 48$

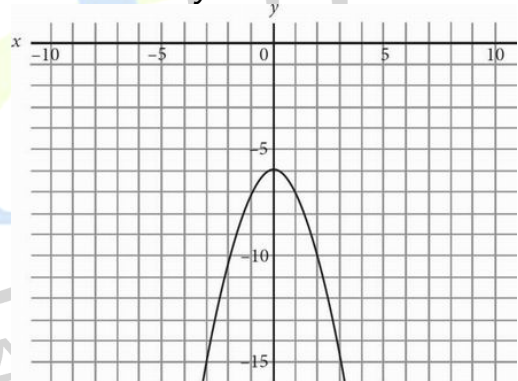
$0.4x + 0.7y = 100$

C. $x + y = 100 \times 2$

$0.4x + 0.7y = 48$

D. $x + y = 100$

$40x + 70y = 48$



6. Which of the following equations best describes the figure above?

A. $y = -x^4 + 6$

B. $y = -(x^2 + 6)$

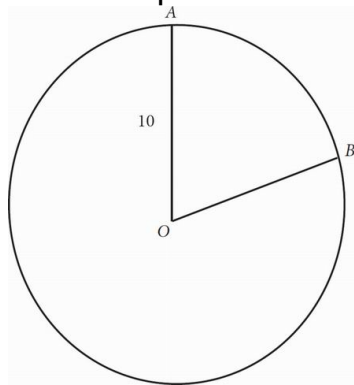
C. $y = -x^2 + 6$

D. $y = x^4 + 6$

7. The price of an item that cost \$43 in 2010 always increases by \$3 per year. The current price in dollars, P , of the item can be represented by the equation $P = 3t + 10$, where t is the number of years since the item was

first manufactured. Which of the following best explains the meaning of the number 10 in the equation?

- A. It is the price of the item in 1999.
- B. It is the price of the item in 2000.
- C. It is the price of the item in 2001.
- D. It is the annual increase in the price of the item.



8. In the circle with center O and radius 10 shown above, $\angle AOB = \frac{2\pi}{5}$. What is the length of minor arc AB ?

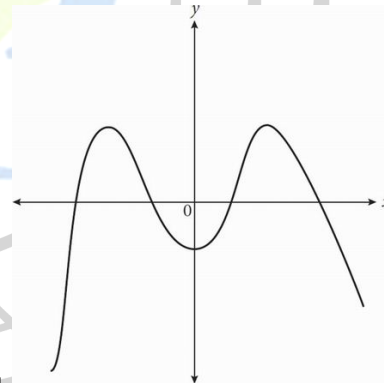
- A. π
 - B. 2π
 - C. 4π
 - D. 20π
9. Clark's Rule is a formula used to determine the correct dosage of adult over-the-counter medicine a child can receive. The child's weight, in pounds, is divided by 150, and the result is multiplied by the adult dose of the medicine. A mother needs to give her daughter acetaminophen, which has an adult dose of 1,000 milligrams. She does not know her daughter's exact weight, but she knows the weight is between 75 and 90 pounds. Which of the following gives the range of correct dosage, d , in milligrams of acetaminophen the daughter could

receive?

- A. $50 < d < 60$
- B. $500 < d < 600$
- C. $1,000 < d < 1,200$
- D. $1,600 < d < 2,000$

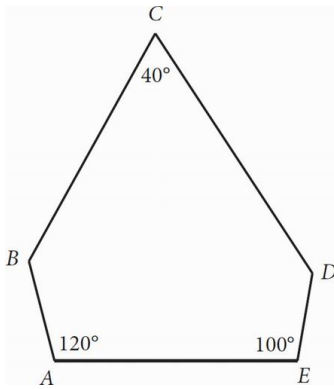
10. Ohm's Law, which can be written as $I R = V$, relates the current I in amperes that flows through a conductive material with resistance R ohms to the voltage V between the two ends. The power P in watts can be related to I and R by the equation $I = \sqrt{\frac{P}{R}}$. Which of the following gives P in terms of V and R ?

- A. $p = \frac{R}{V^2}$
- B. $p = \frac{V}{R}$
- C. $p = \frac{V^2}{R}$
- D. $P = VR$



11. The figure above shows the graph in the xy -plane of the function g . How many distinct real roots does g have?

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



12. In the figure above, $\angle ABC \cong \angle CDE$. Which of the following is true?

A. $AB \parallel CD$
 B. $BC \parallel AE$
 C. $CD \parallel AE$
 D. $BC \cong AE$

13. For which of the following values of w

$$\sqrt[4]{16w^3x^{\frac{9}{w}}} = (2) \left(\frac{3}{3^4} \right) \left(x^{\frac{3}{4}} \right) ?$$

does

A. 2
 B. 3
 C. 4
 D. 6

14. If $r = \left(\frac{1}{2}a + b\right)^2$ and $s = -4ab + 3b$,

what is $r - 2s$ in terms of a and b ?

A. $\frac{1}{4}a^2 + b^2 - 7ab - 6b$
 B. $\frac{1}{4}a^2 + b^2 - 7ab + 6b$
 C. $\frac{1}{4}a^2 + b^2 + 9ab - 6b$
 D. $\frac{1}{2}a^2 + b^2 + 9ab - 6b$

15. Which of the following lines contains all points equidistant from the points $(0, 4)$ and $(8, 0)$ in the xy -plane?

A. $2y = -x + 8$
 B. $2y = x$

C. $y = 2x - 6$
 D. $y = -2x$

16. $h(t) = \frac{1}{2}at^2$.

As a space probe descends to the surface of Mars, its distance in meters above the surface can be modeled by the equation above. If t is the time in seconds it will take the probe to reach the surface, and it takes the probe 8 seconds to descend the final 120 meters to the surface, what is the value of the deceleration constant a ?

17. $3h - j = 7$
 $2h + 3j = 1$

Based on the system of equations above, what is the value of h ?

18. A rectangular box has a volume of 24. If the length is halved and the height is tripled, what will be the new volume of the box?

19. If $6e(e + 3) = 3e(2e + 4) + 5$, what is the value of e ?

20. Abeena is making punch for a winter party in a punch bowl that can hold at most 9 quarts. She wants to get as much vitamin C in her punch as possible, so she is using only orange juice and grape juice. She has 6 quarts of orange juice, which has 2 grams of vitamin C per quart, and 7 quarts of grape juice, which has 1 gram of vitamin C per quart. If there are 4 cups in a quart, what is the greatest possible amount of vitamin C, in grams, that Abeena can have in one cup of her punch?