

Date Completed: _____
Mentor Initials: _____

A mentor can change everything.



Strategy Quiz - Choose Values

- For all nonzero values a and b , the value of which of the following expressions is always positive?
 - $-|a| + |b|$
 - $|a| - |b|$
 - $-3|a| + |b|$
 - $-a - b$
 - $(ab)^4$
- If a, b , and c are positive integers such that $a^b = x$ and $c^b = y$, then which of the following is equivalent to $\frac{x}{y}$?
 - 0
 - $\left(\frac{a}{c}\right)^b$
 - $\frac{a}{c}$
 - $\left(\frac{a}{c}\right)^{2b}$
 - 1
- If a and b are odd integers, then which of the following also produces an odd integer?
 - $a + b$
 - $a - b$
 - $2ab$
 - ab
 - $3a - b$
- Which of the following expressions, if any, are equal for all real numbers x ?
 - $\sqrt{x^4}$
 - $(-x)^2$
 - $(-|x|)^2$
 - I and II only
 - I and III only
 - II and III only
 - I, II, and III
 - None of the expressions are equivalent

5. Clara's personal record for the high jump increased by 10% during her first year on the track team and then increased by 25% during her second year after she began a new training regimen. By what percent did her personal record for the high jump increase over those two years?
- A. 37.5%
B. 35%
C. 25%
D. 15%
E. 2%
6. Let a equal $3b + 2c - 7$. What happens to the value of a if the values of b and c both increase by 2?
- A. It increases by 4
B. It increases by 6
C. It increases by 10
D. It remains the same.
E. Cannot be determined from the given information.
7. Which of the following expressions is equivalent to $\frac{a^2+11a+18}{a+5}$?
- A. $a + 6 - \frac{12}{a+5}$
B. $a + 6 + \frac{48}{a+5}$
C. $a + 16 - \frac{12}{a+5}$
D. $a + 16 + \frac{48}{a+5}$
E. $a^2 + 10a + 13$
8. If x is an integer less than -1 , which of the following orders the expressions $-|x|$, x^2 , and $\frac{1}{x}$ from greatest value to least value?
- A. $x^2 > -|x| > \frac{1}{x}$
B. $x^2 > \frac{1}{x} > -|x|$
C. $-|x| > \frac{1}{x} > x^2$
D. $\frac{1}{x} > x^2 > -|x|$
E. $\frac{1}{x} > -|x| > x^2$

9. Which of the following inequalities is false for all positive integers n ?
- A. $n \geq n^2$
 - B. $n \leq \sqrt{n}$
 - C. $n \leq \frac{1}{n}$
 - D. $n \geq (n + 1)^3$
 - E. $n \geq \sqrt{n + 1}$
10. The set of all values of y that satisfies $|y + 3| < 6$ is the same as the set of all values of y that satisfies:
- A. $0 < y < 3$
 - B. $0 < y < 9$
 - C. $-3 < y < 3$
 - D. $-9 < y < 3$
 - E. $-9 < y < 9$
11. For every pair of real numbers w and z such that $wz = 0$ and $\frac{w}{z} = 0$, which of the following statements is true?
- A. $w \neq 0$ and $z \neq 0$
 - B. $w = 0$ and $z \neq 0$
 - C. $w \neq 0$ and $z = 0$
 - D. $w = 0$ and $z = 0$
 - E. None of the statements is true for every such pair of real numbers w and z .

12. $B(h) = 30(3)^h$

The function $B(h)$ models the number of gallons of a fluid in a tank after h hours. Which of the following models the number of gallons of the fluid in the tank after m minutes?

- A. $B(m) = 30(3)^m$
- B. $B(m) = 30(3)^{\frac{m}{60}}$
- C. $B(m) = 30(3)^{60m}$
- D. $B(m) = 30(3)^{\frac{60}{m}}$
- E. $B(m) = 30(180)^m$

13. Which of the following represents the positive number q increased by 7%?
- A. $.07q$
 - B. $.93q$
 - C. $1.07q$
 - D. $7q$
 - E. $100q$

14. $x^4 - 18x^2 + 81$

Which of the following is equivalent to the expression above?

- A. $(x - 3)^4$
 - B. $(x - 9)^4$
 - C. $(x^2 + 9)(x + 3)(x - 3)$
 - D. $(x - 3)^2(x + 3)^2$
 - E. $(x^2 + 9)^2$
15. During an ice age, the average annual global temperature was at least 40 degrees Fahrenheit lower than the modern average. If the average annual temperature of an ice age is a degrees Fahrenheit and the modern average annual temperature is b degrees Fahrenheit, which of the following must be true?
- A. $a \leq b - 40$
 - B. $a \geq b - 40$
 - C. $a = b - 40$
 - D. $a \geq b + 40$
 - E. $a \leq b + 40$
16. As x continually increases in value without bound, the value of $\frac{x}{x+5}$ most closely approaches:
- A. 0
 - B. $\frac{1}{5}$
 - C. 1
 - D. 5
 - E. ∞

17. For all real values of x , which of the following equations is true?

- A. $\sin(3x) + \cos(3x) = 1$
- B. $\sin(3x) + \cos(3x) = 3$
- C. $3 \sin(3x) + 3 \sin(3x) = 6$
- D. $\sin^2(3x) + \cos^2(3x) = 1$
- E. $\sin^2(3x) + \cos^2(3x) = 3$