

1. Simplify the expressions below:

A.  $2(x+2) - 4x$

B.  $2x(x+2) + 3(x+2)$

C.  $(2x^2 + 2x - 3) - (x^2 - x + 2)$

D.  $1337x - 1337x^2 + 2009 - 1337(x)(1-x)$

2.  $f(x) = x^2 + 10x$

$g(x) = 3x + 2$

$A = f(g(2))$

$B = g(12)$

$C = f(7)$

$D = g(f(-6))$

3. There are 150 students at the local high school. All of the students take at least one of the three classes: Calculus, Chemistry, and Psychology. 87 students take Calculus, 78 students take Chemistry, 57 students take Psychology, 15 take all three, and 20 take only Calculus and Chemistry.

A. The number of Chemistry students

B. The number of Calculus students also enrolled in Chemistry

C. The number of students in Calculus and Psychology but not Chemistry

D. The number of students unfortunate enough to not be enrolled in Calculus.

4. Determine if each statement is "true" or "false".

A: The volume of a cube with a surface diagonal of length  $5\sqrt{2}$  is  $125\sqrt{2}$

B: A triangle with all different angles is said to be scalene.

C: The average of 59, 65, 97, and 54 is 68.75.

D: A square is also a rhombus.

5. Evaluate:

*A*: The ordinate of the midpoint of the of points (1, 4) and (-7, 8)

*B*: The distance between the points (5, 2) and (-1, -6)

*C*: The slope of the line having a y-intercept of 3 and going through (3, 7)

*D*: The slope of a horizontal line

6. *A*: The product of the solutions of  $x^2 + 5x + 6 = 0$

*B*: The product of the solutions of  $x^2 + 7x + 12 = 0$

*C*: The sum of the reciprocals of the solutions of  $x^2 - 9x + 18 = 0$

*D*: The sum of the solutions of  $x^2 - 4x + 3 = 0$

7. Determine the following.

*A*: The distance between (5, 4) and (6, 8)

*B*: The x-intercept of  $7x - 11y = 35$

*C*: The 5<sup>th</sup> power of smallest prime number

*D*: The number of edges there are in a cube

8. Find the following given that:  $x \varphi y = x^3 - 2x + 3y - y^2$

*A*:  $3 \varphi 3$

*B*:  $6 \varphi 1$

*C*:  $-1 \varphi -5$

*D*:  $-2 \varphi 4$

9. Evaluate the expressions:

A.  $\left(\frac{2}{5}\right)^2$       B.  $\left(\frac{1}{2}\right)^3$       C.  $\left(-\frac{9}{10}\right)^3$       D.  $\left(\frac{1}{5}\right)^4$

10. Consider:  $2^{x+y} = 256$   
 $2^{2x-y} = 128$

- A. Find  $x+y$       B. Find  $2x-y$       C. Find  $x$       D. Find  $y$

11. When  $\frac{x^2+6x+8}{x^2+5x+6} \times \frac{x+1}{x-1} \div \frac{x^2+3x+2}{x^2+8x+15}$  is simplified, the result is  $\frac{x^2+ax+b}{x^2+cx+d}$ .

- A. Find  $a$       B. Find  $b$       C. Find  $c$       D. Find  $d$

12.

- A. What is the smallest whole number?  
B. What is the smallest natural number?  
C. What is the smallest prime number?  
D. What is the largest perfect square less than 1000?