7-4 Intercepts and Discriminants

Name: _____   Time› Start: _____   Finish: _____   Total Time = _____

In 1-5, find the x-intercepts and the y-intercepts of the given equations.

1. $f(x)= x^2 + 8x - 9$ x-intercept = _____   y-intercept = _____

2. $f(x)= 3x - 9$ x-intercept = _____   y-intercept = _____

3. $f(x)= x^2 + 6x + 5$ x-intercept = _____   y-intercept = _____

4. $f(x)= 4x^2 - 7x - 2$ x-intercept = _____   y-intercept = _____

5. $f(x)= x^3 + 2x^2 - x - 2$ x-intercept = _____   y-intercept = _____

Discriminants Section

Use the discriminant of each equation to determine how many solutions exist.

1. $3x^2 - x - 8 = 0$
   Number of solutions = _____

2. $2x^2 - 4x + 2 = 0$
   Number of solutions = _____

3. $x^2 - 3x - 10 = 0$
   Number of solutions = _____

4. $4x^2 + x + 10 = 0$
   Number of solutions = _____

5. Consider the equation $x^2 - 6x + 13 = 0$. No real number solutions exist.
   Thus, the equation $f(x) = x^2 - 6x + 13$ does not cross the x-axis – important concept.
   Determine the y-intercept and then calculate the derivative to find the vertex of the parabola.
   Now determine a third point on the parabola without plugging values into the equation.

   y-intercept = _____   vertex = _____   3ʳᵈ point = _____

6. Consider the equation $x^2 + 2x + 2 = 0$. No real number solutions exist.
   Thus, the equation $f(x) = x^2 + 2x + 2$ does not cross the x-axis – important concept.
   Determine the y-intercept and then calculate the derivative to find the vertex of the parabola.
   Now determine a third point on the parabola without plugging values into the equation.

   y-intercept = _____   vertex = _____   3ʳᵈ point = _____

SAT Questions

_____ 7.   If $\dfrac{x}{2} = y$ and $2y = y$, what is the value of x?

_____ 8.   The average (arithmetic mean) of x and y is m, where $m \neq 0$.
What is the average of (arithmetic mean) of x, y, and $2m$?

         A. m B. $\dfrac{4}{3}m$ C. $\dfrac{3}{2}m$ D. $\dfrac{5}{3}m$ E. $2m$

_____ 9.   If $5x^2 - 15x = 0$ and $x \neq 0$, find the value of x.

_____ 10.   If $n = 5^{2000} + 5^{2002}$, then what are the prime factors of n?

         A.   5 only
         B.   2 and 5 only
         C.   2, 5, and 10 only
         D.   2, 5, and 13 only
         E.   2, 5, 1000, and 1001 only