

**SHOW ALL WORK.**

Complete Parts A & B OR Parts B & C

**PART A:**

Use the Quadratic Formula to solve the equation.

1.  $z^2 + 15z + 24 = -32$

2.  $x^2 - 4x - 5 = 0$

3.  $x^2 - 5x + 10 = 4$

4.  $m^2 + 5m - 99 = 3m$

Find the Discriminant. Then give the number and type of solutions to the equation.

5.  $x^2 - 8x + 16 = 0$

6.  $s^2 + 7s + 11 = 0$

7.  $8p^2 + 8p + 3 = 0$

**PART B:**

Use the Quadratic Formula to solve the equation.

8.  $s^2 - s - 3 = s$

9.  $r^2 - 4r + 8 = 5r$

10.  $3x^2 + 7x - 24 = 13x$

11.  $45x^2 + 57x + 1 = 5$

12.  $5p^2 + 40p + 100 = 25$

13.  $9n^2 - 42n - 162 = 21n$

14.  $-3y^2 = 6y - 10$

**Find the Discriminant. Then give the number and type of solutions to the equation.**

15.  $-4w^2 + w - 14 = 0$

16.  $5x^2 + 20x + 21 = 0$

17.  $8z - 10 = z^2 - 7z + 3$

**Solve the equation using any method.**

18.  $16t^2 - 7t = 17t - 9$

19.  $7x - 3x^2 = 85 + 2x^2 + 2x$

20.  $4(x-1)^2 = 6x + 2$

**Describe and correct the error in solving the equation.**

21.

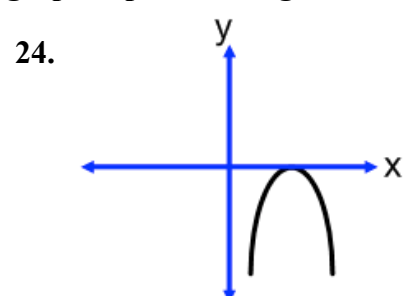
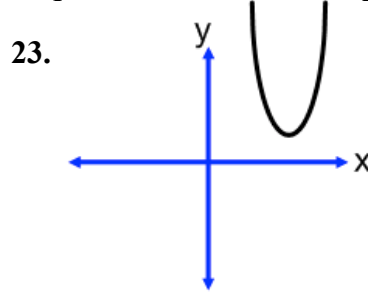
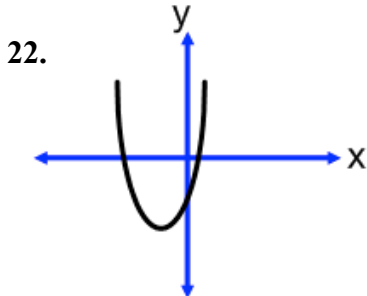
$$x^2 + 6x + 8 = 2$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(8)}}{2(1)}$$

$$x = \frac{-6 \pm 2}{2}$$

$$x = -2, -4$$

**Tell whether the discriminant of the equation for each corresponding graph is positive, negative, or zero.**



25. The number  $S$  of ant species in Kyle Canyon, Nevada can be modeled by the function  $S = -0.000013E^2 + 0.042E - 21$  where  $E$  is the elevation (in meters). Predict the elevation(s) at which you would expect to find 10 species of ants.

**PART C:**

**Use the Quadratic Formula to solve the equation.**

**26.**  $3 - 8v - 5v^2 = 2v$

**27.**  $7x - 5 + 12x^2 = -3x$

**28.** For the quadratic equation  $ax^2 + bx + c = 0$  with two real solutions, show that the mean of the solutions is

$-\frac{b}{2a}$ . How is this fact related to the symmetry of the graph of  $y = ax^2 + bx + c$ ?

**29.** What is the value of  $c$  if the discriminant of  $2x^2 + 5x + c = 0$  is  $-23$ ?

**30.** Use the discriminant to find all values for  $c$  for which the equation  $x^2 - 4x + c = 0$  has  
a) two real solutions, b) one real solution, and c) no real solutions.

**31.** Write a quadratic equation in the form  $ax^2 + bx + c = 0$  such that  $c = 4$  and the equation has the solutions  $-4$  and  $3$ .