
Circle the letter corresponding to your answer. Circle only one answer per question. There is no partial credit on this portion of the quiz.

1. T F The function $f(x) = x^2 - 2x - 4$ has x -intercepts $\left(0, \frac{4 \pm \sqrt{32}}{2}\right)$.

To find the x -intercept, plug in $y = 0$:

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

This does not factor so use the quadratic formula:

$$\begin{aligned}x &= \frac{2 \pm \sqrt{(-2)^2 - 4(1)(-4)}}{2(1)} \\&= \frac{2 \pm \sqrt{4 + 16}}{2} \\&= \frac{2 \pm \sqrt{20}}{2} \\&= \frac{2 \pm 2\sqrt{5}}{2} \\&= 1 \pm \sqrt{5}\end{aligned}$$

Therefore this is **False**

2. T F The solutions of $(x + 4)^2 = 25$ are $(0, -1)$ and $(0, 9)$.

$$(x + 4)^2 = 25$$

$$x + 4 = \pm 5$$

$$x = -4 \pm 5$$

so this is **False**.

3. The function $f(x) = (x + 3)^2 - 11$ has a graph which is a parabola
- A. with vertex $(-3, -11)$ which opens down
 - B. with vertex $(3, -11)$ which opens down
 - C. with vertex $(-3, -11)$ which opens up
 - D. with vertex $(3, -11)$ which opens up
 - E. None of the above

The function $f(x) = (x + 3)^2 - 11$ is a parabola which opens up. The vertex is $(-3, -11)$ so the answer is C.

For the next problem, show all work to receive full credit. No Work = No Credit.

4. The total costs for a company are given by

$$C(x) = 2000 + 20x + x^2$$

and the total revenues are given by

$$R(x) = 130x.$$

Find the break even points.

The break even points occur when $R(x) = C(x)$:

$$\begin{aligned} 2000 + 20x + x^2 &= 130x \\ x^2 - 110x + 2000 &= 0 \end{aligned}$$

Again using the quadratic formula:

$$\begin{aligned} x &= \frac{110 \pm \sqrt{110^2 - 4(2000)}}{2} \\ &= \frac{110 \pm \sqrt{4100}}{2} \\ &= \frac{110 \pm 64.03}{2} \\ &\approx 87 \text{ or } 0 \end{aligned}$$