

Exercise 35

For the following exercises, find the zeros and give the multiplicity of each.

$$f(x) = (3x + 2)^5(x^2 - 10x + 25)$$

Solution

To find the zeros, set $f(x) = 0$ and solve the equation for x .

$$(3x + 2)^5(x^2 - 10x + 25) = 0$$

$$(3x + 2)^5(x - 5)^2 = 0$$

$$(3x + 2)^5 = 0 \quad \text{or} \quad (x - 5)^2 = 0$$

$$3x + 2 = 0 \quad \text{or} \quad x - 5 = 0$$

$$x = -\frac{2}{3} \quad \text{or} \quad x = 5$$

The multiplicity of $x = -\frac{2}{3}$ is 5, and the multiplicity of $x = 5$ is 2.