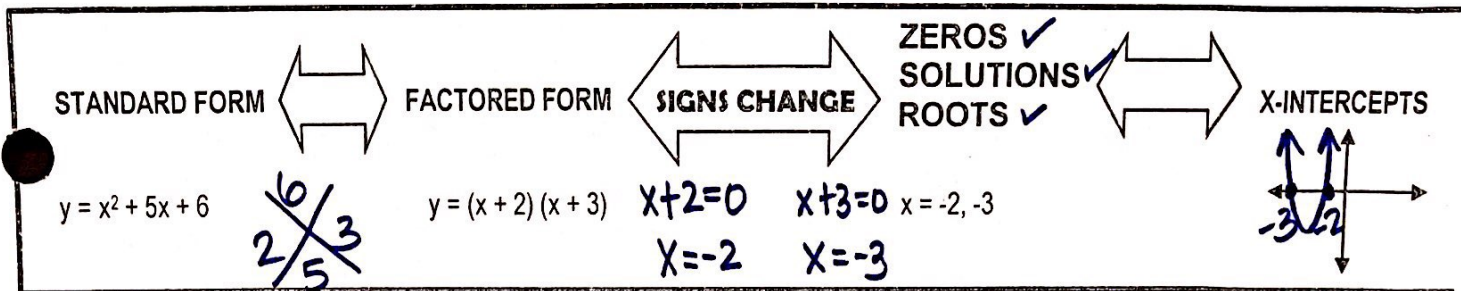


Number of Zeros and Factoring



Find the zeros of each function.

1) $(x+1)(x-1)(x-3) = 0$

$x = -1, 1, 3$

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

$x = -2, 3$

3) $x(x-3)(x+1) = 0$

$x = 0, 3, -1$

4) $x^4 + 25 = 26x^2$
 $x^4 - 26x^2 + 25 = 0$
 $(x^2 - 25)(x^2 - 1) = 0$
 $(x+5)(x-5)(x+1)(x-1) = 0$
 $x = -5, 5, -1, 1$

5) $2x^6 - 10x^5 - 12x^4 = 0$

$2x^4(x^2 - 5x - 6) = 0$
 $2x^4(x-6)(x+1) = 0$

6) $x^3 - 2x^2 - 25x - 50 = -50$

$(x^3 - 2x^2) - (25x + 50) = 0$
 $x^2(x-2) - 25(x-2) = 0$
 $(x^2 - 25)(x-2) = 0$
 $(x+5)(x-5)(x-2) = 0$
 $x = -5, 5, 2$

7) $4x^6 + 4x^5 - 24x^4 = 0$

$2x^4 = 0$
 $x^4 = 0$ (mult. 4)
 $x = 0, 6, -1$

Multiple Zero:

if the "zero" repeats.

Multiplicity:

the amount of times the "zero" repeats.

Find the zeros and state the multiplicity of multiple zeros.

8) $y = (x+8)^2$

$y = (x+8)(x+8)$
 $x = -8$ (mult. 2)

9) $y = x^4(x-2)^3(x+7)^1$

$x = 0$ (mult. 4)
 $x = 2$ (mult. 3)
 $x = -7$

10) $y = x^3 - 4x^2 + 4x$

$y = x(x^2 - 4x + 4)$
 $y = x(x-2)(x-2)$
 $x = 0, 2$ (mult. 2)

11) $y = x^4 + 6x^3 + 8x^2$

12) $6w^3 + 30w^2 - 18w - 90 = 0$

$6(w^3 + 5w^2 - 3w - 15) = 0$
 $6[w^2(w+5) - 3(w+5)] = 0$
 $6(w^2 - 3)(w+5) = 0$
 $w^2 - 3 = 0$
 $\sqrt{w^2} = \sqrt{3}$
 $w = \pm\sqrt{3}, -5$

13) $y^4 + 45 = 14y^2$

14) $x^3 + 3x^2 - 9x - 27 = 0$

#: 2, -7, 15, -19