

$$a=2 \ b=5 \ c=-12$$

$$x = \frac{-5 \pm \sqrt{25 + 96}}{4}$$

$$x = \frac{-5 \pm \sqrt{121}}{4}$$

$$x = \frac{-5 \pm 11}{4}$$

$$x = -\frac{5+11}{4} \quad x = \frac{5-11}{4}$$

Degree = 3

Zeros: $x=0, x=-2$
multiplicity: one, two

End Behavior: x^4

Deg: 4 $x \rightarrow \infty y \rightarrow \infty$

Zeros: $x=0 \quad x=4$

Mult:	three	one
	Cross	Cross

x-intercepts ($y=0$)

Find the zeros algebraically

$$a) f(x) = 2x^2 + 5x - 12$$

$$0 = 2x^2 + 5x - 12$$

$$0 = (2x - 3)(x + 4)$$

$$2x - 3 = 0 \quad x + 4 = 0$$

$$x = \frac{3}{2}$$

$$x = -4$$

$$c) f(x) = x^3 - 25x$$

$$0 = x(x^2 - 25) \quad 0 = x(x+5)(x-5)$$

$$x = 0 \quad x = -5 \quad x = 5$$

State the degree and list the zeros of the polynomial function. State the multiplicity of each zero and whether the graph crosses the x-axis at the corresponding x-intercept. Graph the function on your calculator to verify your answer.

$$a) f(x) = x(x+2)^2$$

$$f(x) = x(x+2)(x+2)$$

$x=0 \rightarrow$ graph crosses x-axis (power odd)

$x=-2 \rightarrow$ graph touches x-axis (power even)

EBM: x^5 multiplicity

$$b) f(x) = (x+3)^3(x-1)^2$$

Deg: 5

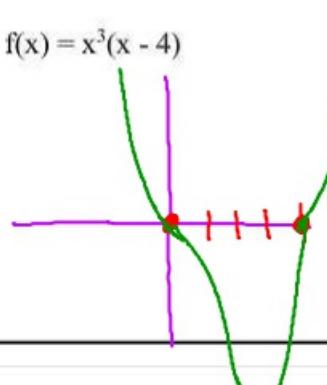
Zeros: $x=-3 \quad x=1$

Mult: three two

$x=-3$ crosses x-axis

$x=1$ touches x-axis

$$c) f(x) = x^3(x-4)$$



$$d) f(x) = 3x(x-2)^3(x-1)^2$$

End Behavior = x^6

Degree = 6

Zeros:	$x=0$	$x=2$	$x=1$
Mult:	one	three	two

Cross Cross Touch

y -int = 0

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y-intercept ($x=0$)

$$f(0) = 0^3(0-4)$$

$$f(0) = 0$$

$$(0,0)$$

x	y
1	-3
2	-16
3	-27

