

Graphing Polynomials Day #1 1/16/18

Warm Up: Graph $f(x) = x^2 - 6x + 5$

$(x-1)(x-5)$

$x=1 \quad x=5$

$a=1 \quad b=-6 \quad c=5$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-6) \pm \sqrt{36 - 4(1)(5)}}{2(1)}$$

$$3 \pm \frac{\sqrt{16}}{2}$$

$$3 \pm \frac{4}{2}$$

$$3 \pm 2$$

$\begin{array}{r} 3 \overline{) 1 \ -6 \ 5} \\ \underline{3 \ -9} \\ 1 \ -3 \ \underline{-4} \end{array}$

EX #1: Given $x-2$ is a factor of $f(x) = x^3 - 3x^2 - 10x + 24$. y intercept point (0, 24)

a. Factor completely.

$x-2$
 $x=2$ zero
 point (2, 0)

$$\begin{array}{r} 2 \overline{) 1 \ -3 \ -10 \ +24} \\ \underline{2 \ -2 \ -24} \\ 1 \ -1 \ -12 \ 0 \end{array}$$

$$x^2 - x - 12 = (x-4)(x+3)$$

$$x-4=0 \Rightarrow x=4$$

$$x+3=0 \Rightarrow x=-3$$

b. Sketch a graph of $f(x)$.

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

0

$f(3) =$

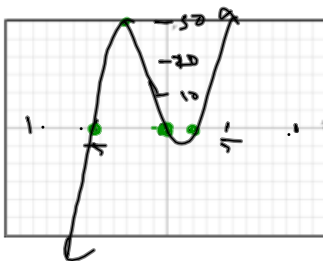
$$\begin{array}{r} 3 \overline{) 1 \ -3 \ -10 \ +24} \\ \underline{3 \ 0 \ -30} \\ 1 \ 0 \ -10 \ -6 \end{array}$$

EX #2: Given $f(x) = x^3 + 3x^2 - 10x + 0$

Factor completely and sketch the graph.

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

$$f(x) = (x-0)(x+5)(x-2)$$



$$\begin{array}{r} 0 \mid 1 \quad 3 \quad -10 \quad 0 \\ \quad \quad 0 \quad 0 \\ \hline 1 \quad 3 \quad -10 \\ x^2 + 3x - 10 \end{array}$$

List

$$y \text{ int} = 0$$

$$x \text{ int (zeros)} = -5, 2, 0$$

point $(-3, -)$

$$\begin{array}{r} -3 \mid 1 \quad 3 \quad -10 \quad 0 \\ \quad \quad -3 \quad 0 \quad 30 \\ \hline 1 \quad 0 \quad -10 \quad 30 \end{array}$$

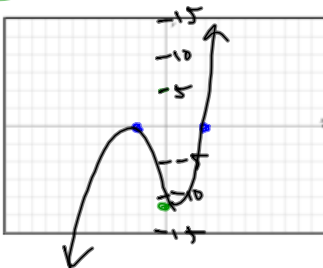
EX #3. Given $x = 3$ is a zero of $f(x) = x^3 + x^2 - 8x - 12$.

Factor completely and sketch the graph.

$$\begin{array}{r} 3 \mid 1 \quad 1 \quad -8 \quad -12 \\ \quad \quad 3 \quad 12 \quad 12 \\ \hline 1 \quad 4 \quad 4 \quad 0 \end{array}$$

$$x^2 + 4x + 4$$

$$(x+2)$$



$$f(x) = (x-3)(x^2 + 4x + 4)$$

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

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

y intercept: -12

Zero: 3, -2m2

Bounce

EX #4 Sketch the graph of $f(x) = (x-3)(x+4)^2(x+1)^3$

