

Name: _____

Hours: _____

Graphing with (g)Roots Notes

Roots are the places where the graph
crosses the x-axis.

We find roots by setting polynomials
equal to zero.

Sometimes there are double roots (multiplicity 2) if a root appears more than once!



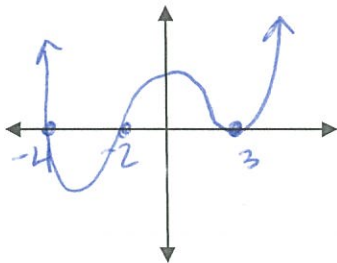
Examples:

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

Roots: $x = 3, 3, -2, -4$

Another way you might see it:

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

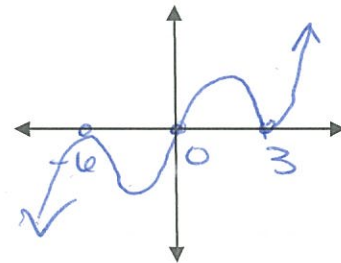


$$f(x) = x(x + 6)^2(x - 3)^2$$

Roots: $0, -6, -6, 3, 3$

Another way you might see it:

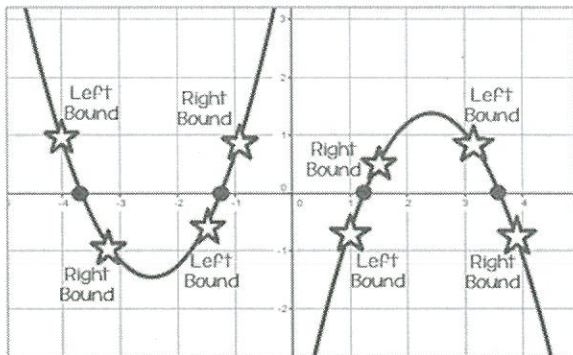
$$f(x) = x(x + 6)(x + 6)(x - 3)(x - 3)$$



Use your graphing calculator to find the roots of the following equations:

Type the equation into the y= section. Hit graph. Calculate "zeros". Left-bound, go to the left of the zero. Right bound, go to the right of the zero. Guess, make a guess.

FINDING ZEROS WITH THE GRAPHING CALCULATOR



2nd TRACE 2: zero Left Bound ENTER Right Bound ENTER ENTER

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

Roots: $-1.171, 1.171$

$$y = -x^3 - 4x + 7$$

Roots: 2.589

Name: Key
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Graphing Roots Worksheet (DMP)

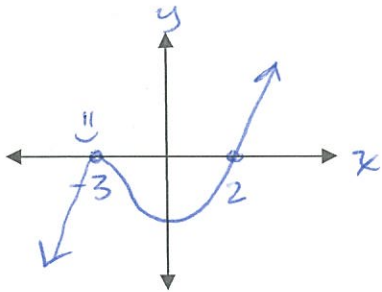
List the roots of each polynomial and sketch the graph based on the given end behavior.

Label the x and y axis.

Label any double roots with a smiley face.

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

$x = -3, -3, 2$

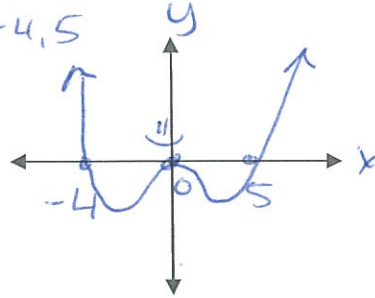


Roots: -3, -3, 2

Number of turning points: 2

2) $f(x) = x^2(x + 4)(x - 5)$

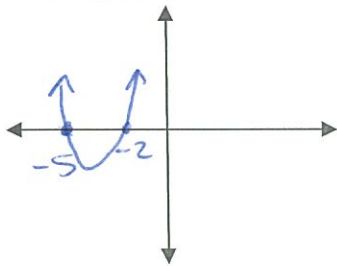
$x = 0, -4, 5$



Roots: -4, 0, 0, 5

Number of turning points: 3

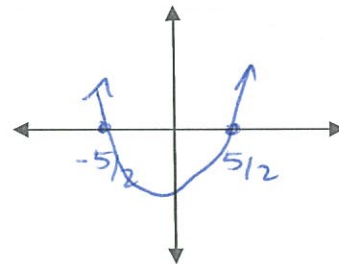
3) $f(x) = x^2 + 7x + 10$
 $(x+5)(x+2)$



Roots: -5, -2

Number of turning points: 1

4) $f(x) = 4x^2 - 25$
 $(2x-5)(2x+5)$



Roots: -5/2, 5/2

Number of turning points: 1