

p.92-93 Finding Zeros using Synthetic Division 6.5

Warm-up

p. 92

Find the roots/zeros of the graph of the following equation. Then sketch the graph.

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

~~$$\begin{array}{r} 3 \\ 4 \end{array} \begin{array}{r} x^2 \\ + 3x \\ - 4 \end{array}$$~~

$$\begin{array}{r|rr} x & x^2 & -1x \\ 4 & 4x & -4 \end{array}$$

$$(x^2 + 4x)(-1x - 4)$$

$$x(x+4) - 1(x+4)$$

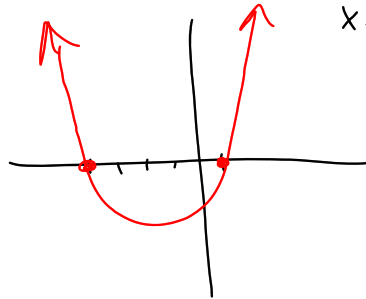
$$(x+4)(x-1)$$

$$x+4=0$$

$$x=-4$$

$$x-1=0$$

$$x=1$$



Graphing Polynomials Quiz -
GREEN worksheet

Algebra 2

Name

ID: 1

Factoring Review

Date

Period

Factor each completely.

$$1) b^2 + 13b + 36$$

$$(b + 4)(b + 9)$$

$$2) n^2 + 12n + 35$$

$$(n + 7)(n + 5)$$

$$3) x^2 - 9$$

$$(x - 3)(x + 3)$$

$$4) k^2 - k$$

$$k(k - 1)$$

$$5) 6n^2 - 24n$$

$$6n(n - 4)$$

$$6) 6b^2 - 102b + 420$$

$$6(b - 7)(b - 10)$$

-1-

$$7) 4x^2 - 4x$$

$$4x(x - 1)$$

$$8) 5n^2 + 60n - 100$$

$$5(n + 10)(n - 2)$$

$$9) 16b^2 - 9$$

$$(4b + 3)(4b - 3)$$

$$10) 9n^2 - 4$$

$$(3n + 2)(3n - 2)$$

$$11) 15n^2 + 21n$$

$$3n(5n + 7)$$

$$12) 21n^2 + 30n + 9$$

$$3(7n + 3)(n + 1)$$

-2-

We can find roots/zeros of higher degree polynomials by using SYNTHETIC DIVISION

p. 93

Use synthetic division to find the polynomial function's Factored Form and Zeros. One zero has been given.

1.) $f(x) = x^3 - 4x^2 - 7x + 10$; zero at $x = -2$

$$\begin{array}{r|rrrr} -2 & 1 & -4 & -7 & 10 \\ & \downarrow & -2 & +2 & -10 \\ \hline & 1 & -6 & 5 & 0 \\ & x^2 & x & c & R \end{array}$$

$$x^2 - 6x + 5$$

$$\begin{array}{r} x \quad -1 \\ \hline x^2 \quad -1x \\ -5 \quad -5x + 5 \end{array}$$

Factored Form:

$$f(x) = (x-5)(x-1)(x+2)$$

Zeros: 5, 1, -2

p. 93

Use synthetic division to find the polynomial function's Factored Form and Zeros. One zero has been given.

2.) $f(x) = x^3 + 2x^2 - x - 2$; zero at $x = 1$

$$\begin{array}{r|rrrr} 1 & 1 & 2 & -1 & -2 \\ & \downarrow & & & \\ \hline & 1 & 3 & 2 & \end{array}$$

$$\begin{array}{cccc} 1 & 3 & 2 & 0 \\ x^2 & x & c & R \end{array}$$

$$x^2 + 3x + 2$$

$$\begin{array}{r} 2 \overline{) 3} \\ \underline{2} \\ 1 \\ 2 \overline{) 1} \\ \underline{2} \\ 0 \end{array} \quad \begin{array}{r} x 1 \\ \times \begin{array}{|c|c|} \hline x^2 & +x \\ \hline +2x & +2 \\ \hline \end{array} \end{array}$$

FF: $f(x) = (x+2)(x+1)(x-1)$

Zeros: $-2, -1, 1$

p. 93

Use synthetic division to find the polynomial function's Factored Form and Zeros. One zero has been given.

3.) $f(x) = x^3 + 5x^2 + 2x - 8$; zero at $x = -4$

$$\begin{array}{r|rrrr} -4 & 1 & 5 & 2 & -8 \\ & \downarrow & & & \\ \hline & 1 & 1 & -2 & \end{array}$$

$$\begin{array}{cccc} 1 & 1 & -2 & 0 \\ x^2 & x & c & R \end{array}$$

$$x^2 + x - 2$$

$$\begin{array}{r} 2 \overline{) 1} \\ \underline{-2} \\ -1 \\ 2 \overline{) -1} \\ \underline{-2} \\ 1 \\ 2 \overline{) 1} \\ \underline{2} \\ 0 \end{array} \quad \begin{array}{r} x -1 \\ \times \begin{array}{|c|c|} \hline x^2 & -x \\ \hline 2x & -2 \\ \hline \end{array} \end{array}$$

FF: $f(x) = (x+2)(x-1)(x+4)$

Zeros: $-2, 1, -4$

Homework