

Name:

Date:

Period:

Assessment R1

1. (4 points) A polynomial $p(x)$ has a zero of -3.

Explain what the zero tells you about the factors, graph, or equation of the polynomial. Be specific!

A zero is -3 means that:

→ A factor is $(x+3)$ because $(-3+3=0)$

→ The graph crosses the x-axis at -3

2. (3 points) Show that 4 is a zero of the following polynomial:

$$2x^3 - 3x^2 - 17x - 12$$

Method 1: Substituting

$$2(4)^3 - 3(4)^2 - 17(4) - 12$$

$$= 0$$

Method 2: Division

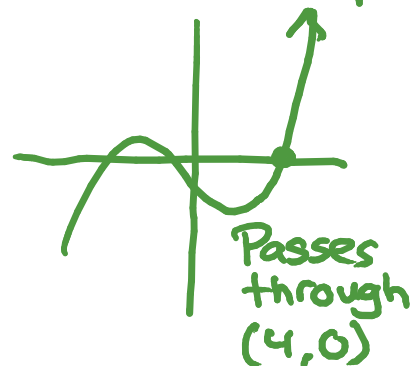
$$4 \overline{) 2 \ -3 \ -17 \ -12}$$

$$\downarrow \quad 8 \quad 20 \quad 12$$

$$2 \quad 5 \quad 3 \quad 0$$

↓
Remainder 0

Method 3: Graph



3. (2 points each) Write a polynomial function with the following zeroes in factored form

a) The zeros are -2 and 1.

→ Remember, the signs get switched!

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

b) The zeros are -1, 2, and 7.

$$g(x) = (x+1)(x-2)(x-7)$$

4. (4 points) If $f(x) = x^3 - 5x^2 - 41x + 45$ and $f(-5) = 0$, then find all of the zeros of $f(x)$ algebraically.

Use synthetic division:

$$\begin{array}{r|rrrr} -5 & 1 & -5 & -41 & 45 \\ & & -5 & 50 & -45 \\ \hline & 1 & -10 & 9 & 0 \end{array}$$

$$x^2 - 10x + 9$$

$$(x-9)(x-1) = 0$$

$$x=9 \quad x=1$$

~~$$\begin{array}{r} -10 \\ -9 \quad -1 \\ 9 \end{array}$$~~

The zeroes are -5, 1, and 9

Factor the following completely:

5. (3 points) $(x+2)^2 - 3(x+2) - 10$

$$y = x+2$$

$$y^2 - 3y - 10$$

$$(y-5)(y+2)$$

~~$$\begin{array}{r} -3 \\ -5 \quad +2 \\ -10 \end{array}$$~~

$$(x+2-5)(x+2+2)$$

$$(x-3)(x+4)$$

6. (3 points) $(x^3 + x^2 + 7x^2 + 7x + 12x + 12)$

$$x^2(x+1) + 7x(x+1) + 12(x+1)$$

$$(x^2 + 7x + 12)(x+1)$$

$$(x+4)(x+3)(x+1)$$

~~$$\begin{array}{r} 7 \\ 4 \quad 3 \\ 12 \end{array}$$~~

7. (3 points) $(a-3)^2 - (c+1)^2$

$$y = a-3$$

$$y^2 - x^2 =$$

$$x = c+1$$

$$(y-x)(y+x) =$$

$$[(a-3)-(c+1)][(a-3)+(c+1)] = (a-c-4)(a+c-2)$$

8. (4 points) Solve the following by factoring:

$$(x^3 - 2x^2)(-9x + 18) = 0$$

$$x^2(x-2) - 9(x-2)$$

$$(x^2 - 9)(x-2) = 0$$

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

$$x=3 \quad x=-3 \quad x=2$$

(2 points) Draw a rough sketch of the graph to indicate that you are correct (you may use your calculator)

