Name **Key**   Date _____ Pd ___

4.5 – 4.7 Quiz Review

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Factoring	1	3	2
Rational Root Theorem		4, 5	
Descartes' Rule of Signs		6, 7	
Transformations	8	9	
Graphing & Describing Graphs	10, 11		
Relative/Local Max/Min	10, 11		
Absolute Max/min	10, 11		
Increasing/Decreasing			10, 11
Domain/Range		10, 11	
Writing Functions from Zeros		14	

I. Solve by factoring.

1) $4a^2 - 12a + 8 = 0$

$$a = 2, 1$$

2) $5x^3 - 135 = 0$

$$x = 3, \ \frac{-3 \pm 3i\sqrt{3}}{2}$$

3) $2r^3 - 3r^2 - 2r + 3 = 0$

$$r = -1, 1, \frac{3}{2}$$

II. Rational Root Theorem

4) $3x^3 + 6x^2 - 5x + 12 = 0$

$$\pm 1, \pm \frac{1}{3}, \pm 2, \pm \frac{2}{3}, \pm 3, \pm 4,$$
$$\pm \frac{4}{3}, \pm 6, \pm 12$$

5) $2x^4 - x^2 + 3x + 1 = 0$

$$\pm 1, \ \pm \frac{1}{2}$$

III. Descartes's Rule of Signs

6) $f(x) = 3x^4 + 4x^2 - 5x - 10$

+	−	i
1	1	2

= 4

7) $g(x) = x^3 - 2x^2 - 19x + 20$

+	−	i
2	1	0
0	1	2

= 3

IV. Transformations

8) Describe the transformations from $f(x) = x^3$ to $g(x) = \frac{1}{3}(x+2)^3$.

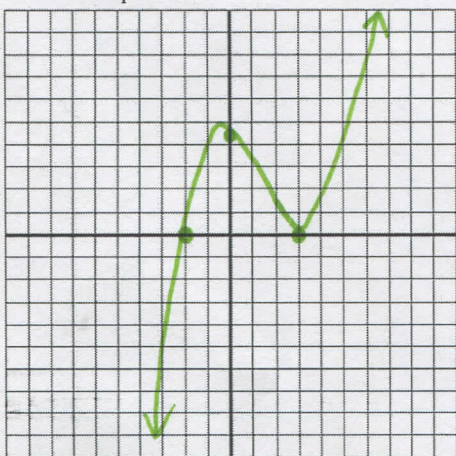$$VC \frac{1}{3} \quad \& \leftarrow 2u$$

9) Given $h(x) = x^2 - 2x + 5$, perform the following transformations to create $k(x)$.

Vertical compression by $\frac{1}{2}$, reflection over the x-axis, and shifted down 4 units.
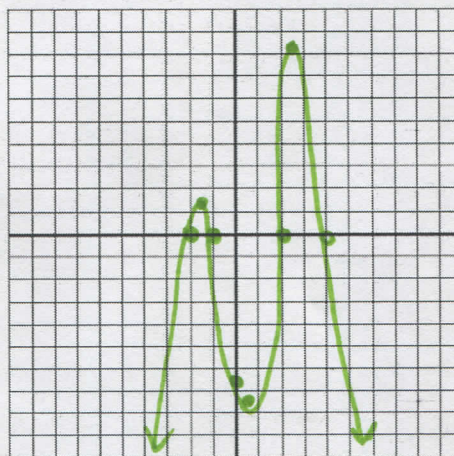
$$k(x) = -\frac{1}{2}x^2 + x - \frac{13}{2}$$

V. Graphing & Describing the Graphs

10) $f(x) = \frac{1}{4}(x+2)(x-3)^2$

Number of turns: __2__

Relative max: $(-0.333, 4.63)$

Relative min: $(3, 0)$

Absolute max: __none__ ⎱ odd

Absolute min: __none__ ⎰ function

Increasing: $(-\infty, -0.333) \cup (3, \infty)$

Decreasing: $(-0.333, 3)$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

11) $j(x) = -2(x+2)(x-2)(x+1)(x-4)$

Number of turns: __3__

Relative max: $(-1.557, 9.755)$

Relative min: $(0.601, -39.603)$

Absolute max: $(3.206, 41.934)$

Absolute min: __none__ ⎱ even neg

Increasing: $(-\infty, -1.557) \cup (0.601, 3.206)$

Decreasing: $(-1.557, 0.601) \cup (3.206, \infty)$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 41.934]$

VI. Writing/Modeling Polynomial Functions

14) Given the zeros write the lowest degree polynomial function.
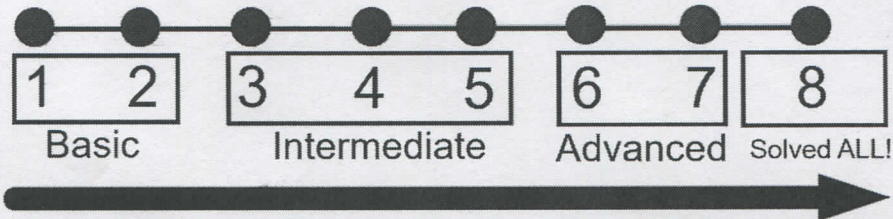
    a. $x = 2, -1, \sqrt{3}$

    b. $x = -3, 4, -3i$

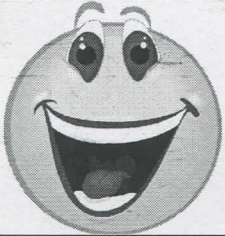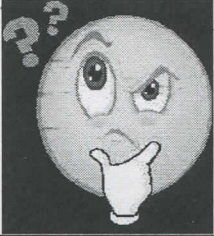$$f(x) = x^4 - x^3 - 5x^2 + 3x + 6$$

$$g(x) = x^4 - x^3 - 3x^2 - 9x - 108$$

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*
Rate your mastery level!
How confident are you with the skills this CYU covered? Circle the score you would give yourself.

1 2	3 4 5	6 7	8
Basic	Intermediate	Advanced	Solved ALL!

Concept	😃	🤔	😫
Solving Polynomial Functions			
Synthetic Division			
Long Division			
Determining the Degree			
Finding the y-intercept			
Finding the zeros			
Multiplicity			
Rational Root Theorem			
Descartes's Rule of Signs			
Complex Conjugates Theorem			
Irrational Conjugates Theorem			
Number of Turns			
Vertical Stretch			
Vertical Compression			
Horizontal Stretch			
Horizontal Compression			
Translate Right			
Translate Left			
Translate Down			
Translate Up			
Reflection over x-axis			
Reflection over y-axis			
Factors			
Local/Relative Max/Min			
Absolute Max/Min			
Even Function			
Odd Function			
End Behavior			
Writing functions given zeros			
Error analysis			
Factoring with cubes SOAP			
Factoring quadratics			
Quadratic formula			
Factoring by grouping			
Scientific Notation			
Perimeter			
Pie Chart/Circle Graph			
Mean			
Median			

GOALS

Questions
ASK

Come in for one on one help!