Name: **Key**   Date: _____   Period: _____

4.5 Solving Polynomial Equations CYU

☑ Use when you get it right all by yourself

S Use when you did it all by yourself, but made a silly mistake

H Use when you could do it alone with a little help from teacher or peer

G Use when you completed the problem in a group

X Use when a question was attempted but wrong (get help)

N Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Solving polynomial equations by factoring	1	2	
GCF	1		
Factoring by Grouping	2		
Factoring Trinomials		1	
Finding zeros	3, 4	5	
Sketching Polynomials	3 – 5		
Finding all real solutions		6, 7	

Solve the equation. Show all work to earn full credit.

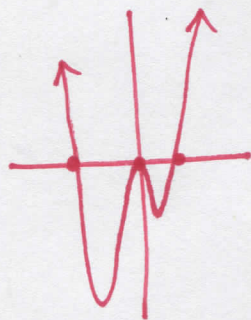1. $2x^4 - 4x^3 = -2x^2$

$$X = 0, 1$$

2. $y^3 - 27 = 9y^2 - 27y$

$$y = 3$$

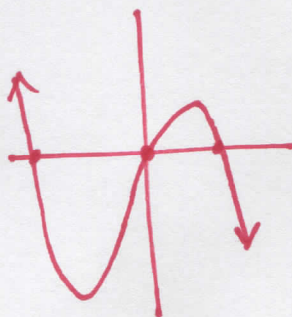Find the zeros of the function. Then sketch a graph of the function.

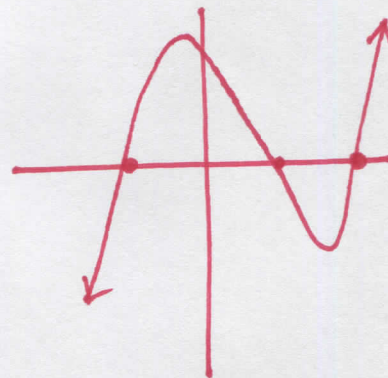3. $h(x) = x^4 + x^3 - 6x^2$

$$X = -3, 0, 2$$

4. $h(x) = -x^3 - 2x^2 + 15x$

$$X = -5, 0, 3$$

5. $P(x) = x^3 - 5x^2 - 4x + 20$

$$X = \pm 2, 5$$

Find all the real solutions of the equation.

6. $x^3 + x^2 - 17x + 15 = 0$

$$X = -5, 1, 3$$

7. $x^3 - 16x^2 + 55x + 72 = 0$

$$X = -1, 8, 9$$

8. $3x^3 + x^2 - 38x + 24 = 0$

$$X = -4, \tfrac{2}{3}, 3$$

Find all the real zeros of the function.

9. $p(x) = 2x^3 - x^2 - 27x + 36$

$x = -4, 1.5, 3$

10. $G(x) = 3x^3 - 25x^2 + 58x - 40$

$x = \frac{4}{3}, 2, 5$

Write a polynomial function f of least degree that has a leading coefficient of 1 and the given zeros.

11. $-2, 3, 6$

$f(x) = x^3 \cancel{+x^2} - 7x^2 + 36$

12. $-2, 1 + \sqrt{7}$

$f(x) = x^3 - 10x - 12$

13. $-6, 0, 3 - \sqrt{5}$

$f(x) = x^4 - 32x^2 + 24x$

14. **MODELING WITH MATHEMATICS** During a 10-year period, the amount (in millions of dollars) of athletic equipment E sold domestically can be modeled by $E(t) = -20t^3 + 252t^2 - 280t + 21,614$, where t is in years.

a) Write a polynomial equation to find the year when about $24,014,000,000 of athletic equipment is sold.

$-20t^3 + 252t^2 - 280t - 2400 = 0$

b) List the possible whole-number solutions of the equation in part (a). Consider the domain when making your list of possible solutions.

$1, 2, 3, 4, 5, 6, 8, 10$

c) Use synthetic division to find when $24,014,000,000 of athletic equipment is sold.

$t = 5$ yrs & 10 years

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!