Integrated Math III

Name: _____

Per: _____   Date: _____

Unit 6 Test Study Guide
Take note of NON-CALCULATOR questions

1. Write each polynomial in standard form and classify by degree and number of terms: **(NON-CALC)**

   a. $x^2 - 4$

   b. $x^3 - 4x^3 + 6x^3$

   c. $x^2 - x^3 - x^4 + 5x^3$

   d. 172

2. Solve the following polynomial equations.

   c. $(x - 3)(x^2 - 1) = 0$

   d. $(x^2 - 25)(x^2 + 5x + 4) = 0$

   e. $10x^3 + 5x^2 - 2x - 1 = 0$

   f. $\sqrt{x + 7} = (x - 1)^2$ (hint: use your calculator!)

   g. $5x^2 = 20x$

   h. $4x^2 - 15x - 25 = 0$

3. Is $(4x + 3)$ a factor of $(12x^3 - 11x^2 + 9x + 18)$?

4. Is $x = -1$ a solution of $(3x^3 + 5x - 1)$?

5. The polynomial $g(x) = x^3 - 9x^2 + 26x - 24$ has values in the table provided below.
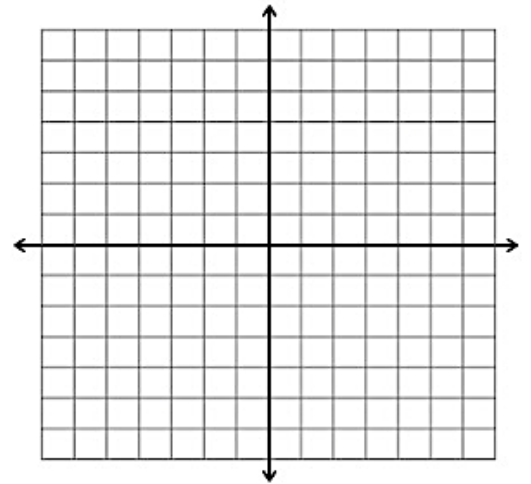
x	-2	-1	0	1	2
$g(x)$	-120	-60	-24	-6	0

a. What is the x-intercept?

b. Use the table to help you write the polynomial so it is in factored form.
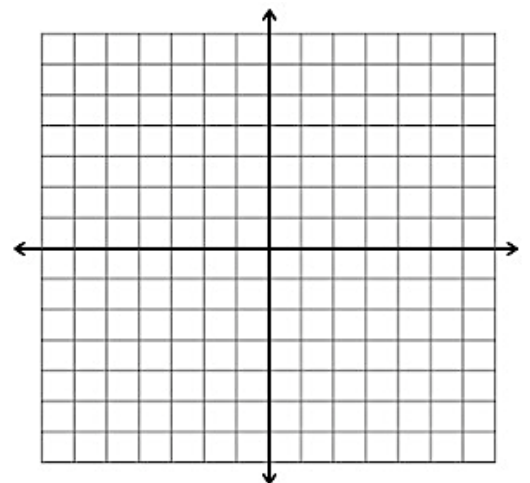   **(Hint: use the x-intercept and an area model to divide)**

Factored Form: $g(x) =$ _____
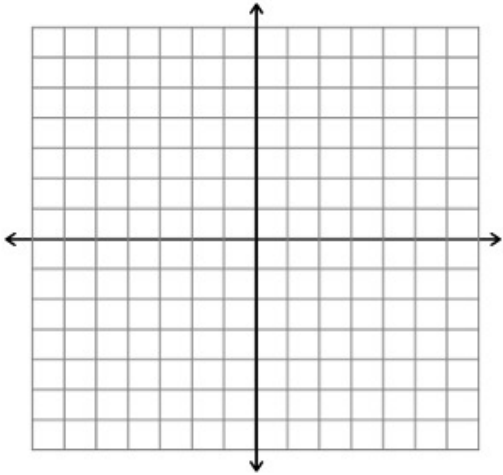
c. Graph the polynomial.

6. Use the <u>area model</u> to divide and solve the problem below.

a. If the polynomial $h(x) = -x^3 - 16x^2 - 75x - 108$ has the x-intercept $x = -4$. Find all other x-intercepts of the polynomial. Write the polynomial in factored form and graph it.
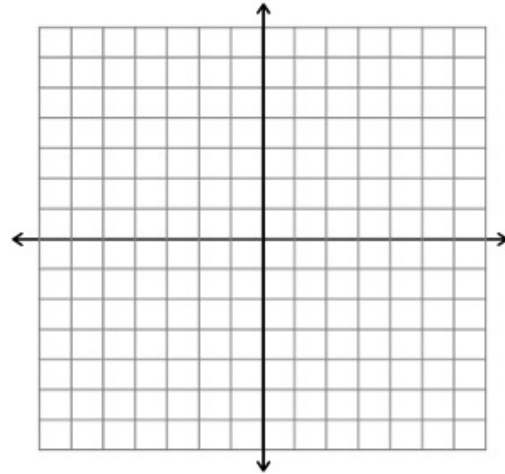
7. Graph the following polynomials. Be sure to consider multiplicity (repeating x-intercepts) **(NON-CALC)**

   a. $f(x) = (x - 2)(x - 3)^2$

   b. $g(x) = -(x + 1)^2(x - 2)^2$

8. Sketch the end behavior of the following polynomial functions. **(NON-CALC)**
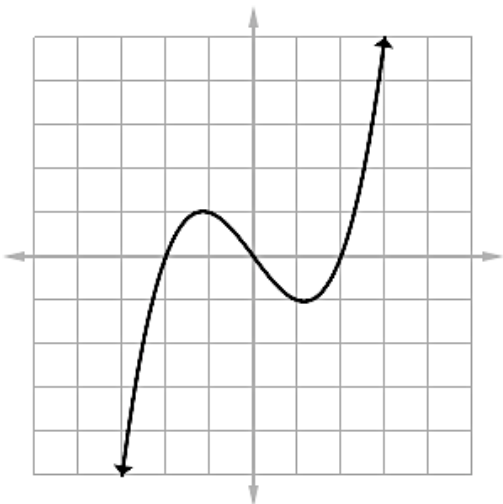
   a. $x^5 - x^7$

   b. $2x - 5 + x + 2 - x^3$

   c. $x^4 - 7 + x$

9. Given the following graphs, determine the information below. **(NON-CALC)**

   a.

   End Behavior:

   Leading Coefficient Sign:

   Degree of Function:

   x-intercepts:

   Factors:

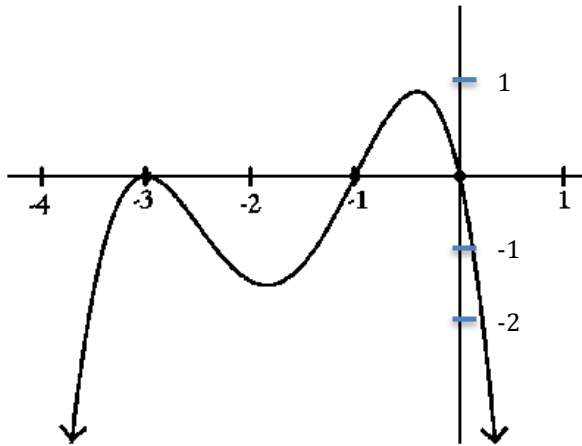   Equation in Factored Form:

   Y-intercept:

   Relative Minimum(s):

   Relative Maximum(s):

   Increasing Intervals:

   Decreasing Intervals:

b. **(NON-CALC)**

End Behavior:

Leading Coefficient Sign: Degree of Function:

X-intercepts: Factors:

Equation in Factored Form:

Y-intercept:

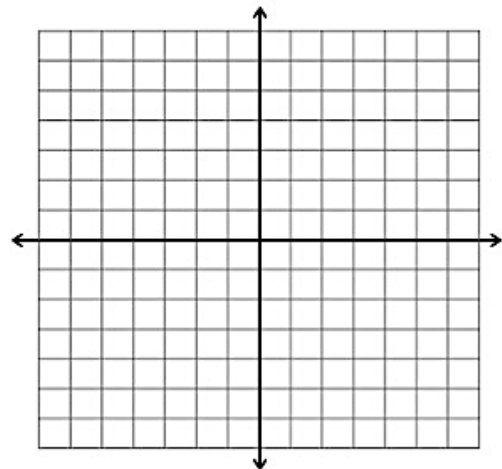Relative Minimum(s):   Relative Maximum(s):
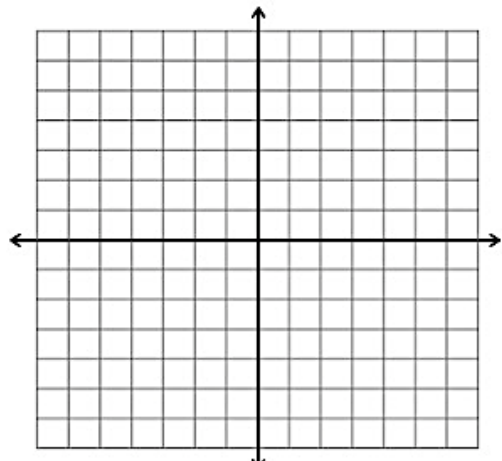
Increasing Intervals: Decreasing Intervals:

10. Given the following functions, solve for their inverses and then verify the results graphically.

a. $h(x) = 3(x - 1)$

b. $h(x) = \frac{1}{5}(x + 6)$
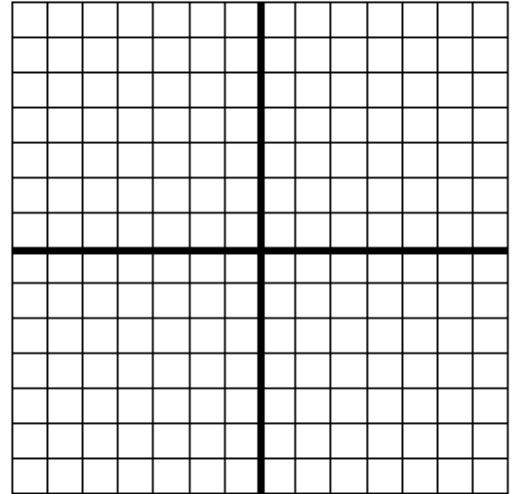
11. Graph each of the polynomial below.

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

Classify *(by degree):*

Degree: _____ Even / Odd;   LC:____ + / -

End Behavior:

Maximum number of turns:___

x-intercepts: _____   y–intercept: _____

Verify that each of your x-intercepts are correct using the Factor/ Remainder theorems:

Create an XY table with all intercepts included

12. Graph the polynomial below. *Hint: factor first.*
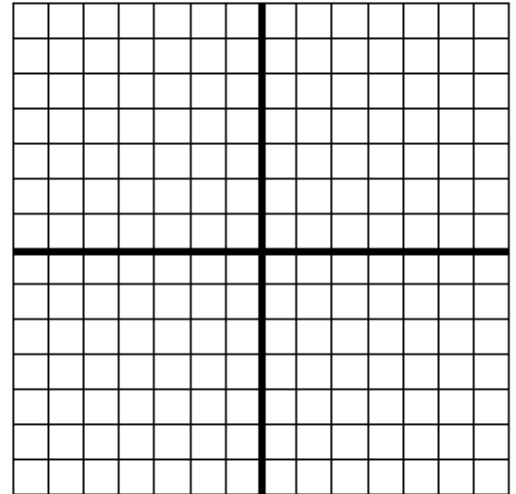
$$f(x) = x^3 + 7x^2 + 16x + 12$$

Classify *(by degree & term)*:

Degree: _____ Even / Odd;   LC:_____ + / -

End Behavior:

Maximum number of turns:_____

Use Polynomial Division to FACTOR COMPLETELY

x-intercepts: _____   y–intercept: _____

Verify that each of your x-intercepts are correct using the Factor/ Remainder theorems: