

**DO NOT USE A CALCULATOR ON THIS WORKSHEET!!!!**

Find the zeros of each function.

1)  $y = x(x + 4)(x - \frac{3}{8})$  1) \_\_\_\_\_

2)  $f(x) = (x - 9)(x + 7)^2(x - 5)$  2) \_\_\_\_\_

3)  $y = x^2 + x - 2$  3) \_\_\_\_\_

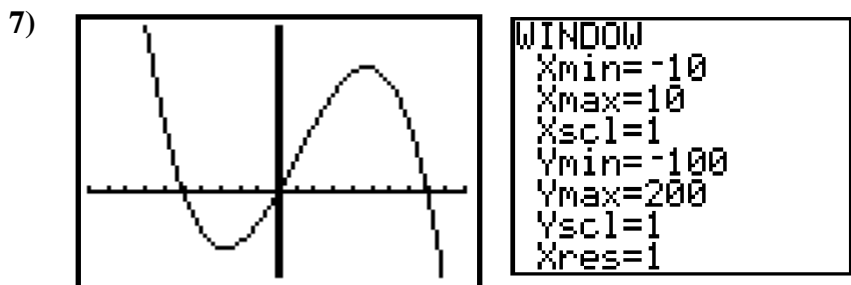
4)  $g(x) = x^4 + 3x^3 + 2x^2$  4) \_\_\_\_\_

Write a polynomial function in STANDARD form with the given zeros.

5)  $x = 1, -2, 3$  5) \_\_\_\_\_

6)  $x = 0, 1$  with a multiplicity of 2 6) \_\_\_\_\_

Given the following graphs, answer the following questions.



Degree: \_\_\_\_\_

# of Linear Factors: \_\_\_\_\_

# of Turning Points: \_\_\_\_\_

Crossing Zeros

Touching Zeros

TOTAL # of Zeros

\_\_\_\_\_

Write the equation for the polynomial in factored form: \_\_\_\_\_

Circle any of the following Critical Points if the graph has them:

Maximum

Minimum

Relative Maximum

Relative Minimum

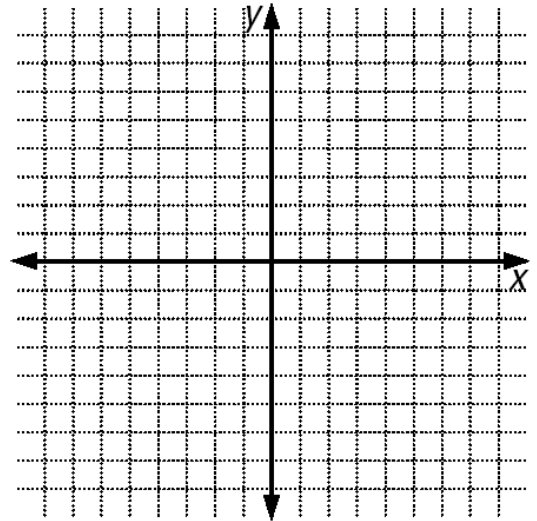
Complete the statement about end behavior

As  $x \Rightarrow$  \_\_\_\_\_,  $f(x) \Rightarrow$  \_\_\_\_\_

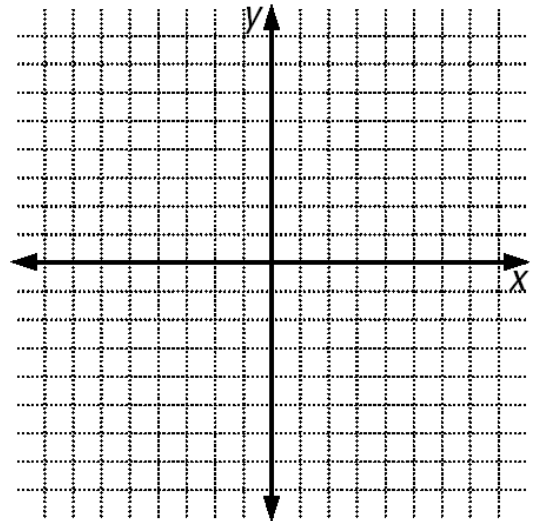
As  $x \Rightarrow$  \_\_\_\_\_,  $f(x) \Rightarrow$  \_\_\_\_\_

Sketch a graph of the following polynomials. NO CALCULATOR.

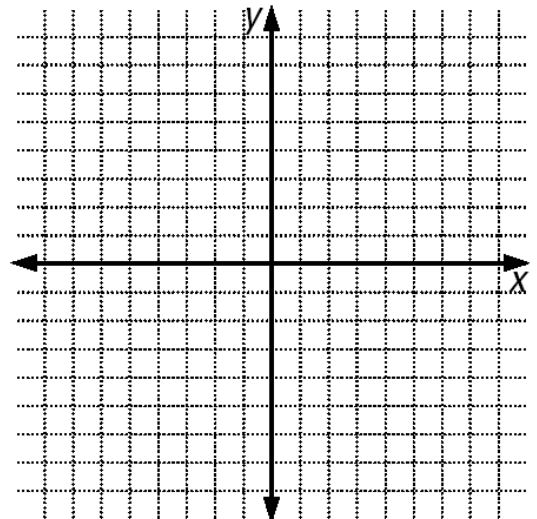
8)  $y = x^2(x - 3)(x + 6)^4$



9)  $y = -x(x + 7)^2(x - 5)^2(x + 4)$



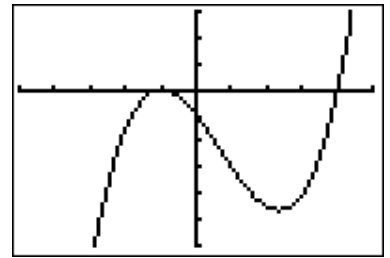
10)  $f(x) = x^3 + 3x^2 - 18x$



11)

- a) How many turning points are there?
- b) What is the degree of this polynomial?
- c) How many touching zeros are there?
- d) How many crossing zeros are there?
- e) How many total zeros are there?
- f) What is the y-intercept?
- g) What are the factors?
- h) Solve for a.

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- e) \_\_\_\_\_
- f) \_\_\_\_\_
- g) \_\_\_\_\_
- h) \_\_\_\_\_



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WINDOW
Xmin=-5
Xmax=5
Xscl=1
Ymin=-6
Ymax=3
Yscl=1
Xres=1

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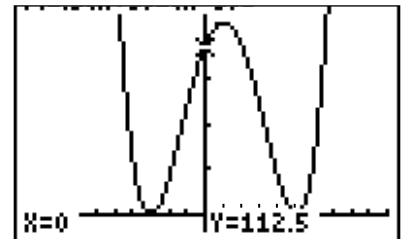
- i) Write the equation.
- j) What is the relative maximum?
- k) What is the relative minimum (approximate)
- l) Describe the end behavior.

- i) \_\_\_\_\_
- j) \_\_\_\_\_
- k) \_\_\_\_\_
- l) \_\_\_\_\_

12)

- a) How many turning points are there?
- b) What is the degree of this polynomial?
- c) How many touching zeros are there?
- d) How many crossing zeros are there?
- e) How many total zeros are there?
- f) What is the y-intercept?
- g) What are the factors?
- h) Solve for a.

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- e) \_\_\_\_\_
- f) \_\_\_\_\_
- g) \_\_\_\_\_
- h) \_\_\_\_\_



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WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-10
Ymax=150
Yscl=30
Xres=1

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- i) Write the equation.
- j) Describe the end behavior.

- i) \_\_\_\_\_
- j) \_\_\_\_\_