

**Secondary Math**  
**Module 3 Study Guide**  
**Polynomials**

**Directions: Show all work.**

**Identify the following functions as linear, exponential, quadratic, cubic, quartic or logarithmic.**

1.

x	y
0	1
1	2
2	4
3	8

2.

x	y
0	0
1	1
2	8
3	27

3.

x	y
1	0
2	1
4	2
8	3

4.

x	y
0	1
1	2
2	4
3	7

5.

x	y
0	1
1	2
2	3
3	4

**Use the equations below to answer questions 6-9.**

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

$$g(x) = x^2 + 2$$

$$h(x) = x^3 + 3$$

6. Find  $f(x) + g(x)$

7. Find  $f(x) - g(x)$

8. Find  $f(x) \cdot g(x)$

9. Find  $f(x)[h(x) + g(x)]$

**Solve for x for questions 10-12.**

10.  $(x + 4)(x - 3)(x + 1) = 0$

11.  $x^2 + 4x = -3$

12.  $9x^2 - 25 = 0$

**For 13-14: Use the Remainder Theorem to determine if the following are roots of the given polynomial; State the remainder and YES OR NO, it is a root/factor.**

13.  $(n^3 + n^2 - 28n + 28); f(-4)$ .

14.  $(x^3 + 3x^2 - 59x + 30) \div (x - 6)$ .

**For 15-16: Write a polynomial for the given information in Factored Form AND Standard Form:**

15. Given: leading coefficient of 2, and the following roots: -1, 2, -3.

Factored: \_\_\_\_\_

16. Given: leading coefficient of -3, and the following roots: 4, 2i, and \_\_\_\_\_.

Factored: \_\_\_\_\_

Standard: \_\_\_\_\_

Standard: \_\_\_\_\_

**For 17-18: Divide the following polynomials to factor COMPLETELY, state ALL roots.**

17.

$$x + 2 \sqrt{x^3 + 3x^2 - 10x - 24}$$

18.

$$3x - 1 \sqrt{3x^3 - 7x^2 - 70x + 24}$$

\*\*I changed this problem

X= \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_

X= \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_

Graph the following functions, make sure to label all points clearly.

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

Roots, including multiplicity:

\_\_\_\_\_   
 Degree of function: \_\_\_\_\_

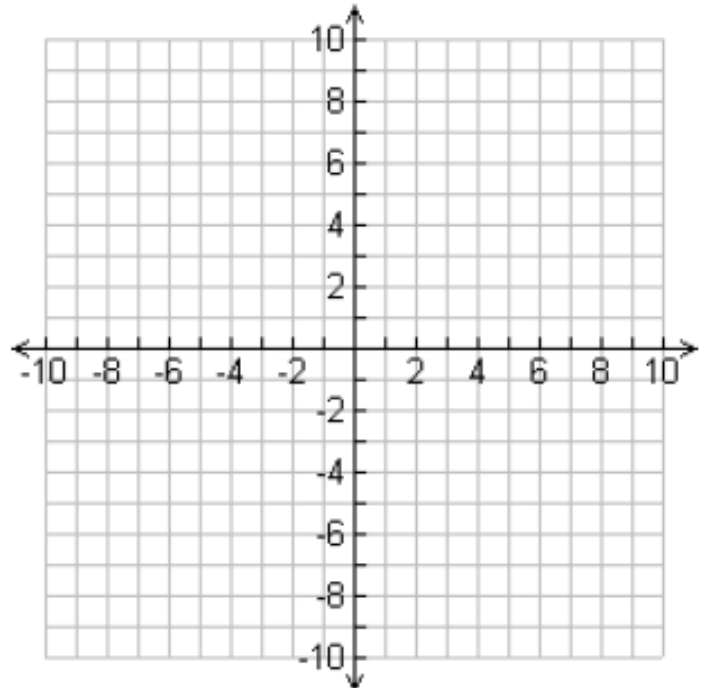
Degree: (circle) odd or even

Leading coefficient: positive or negative

End Behavior:

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



20.  $f(x) = -(x - 4)^4(x - 1)^2$

Roots, including multiplicity:

\_\_\_\_\_   
 Degree of function: \_\_\_\_\_

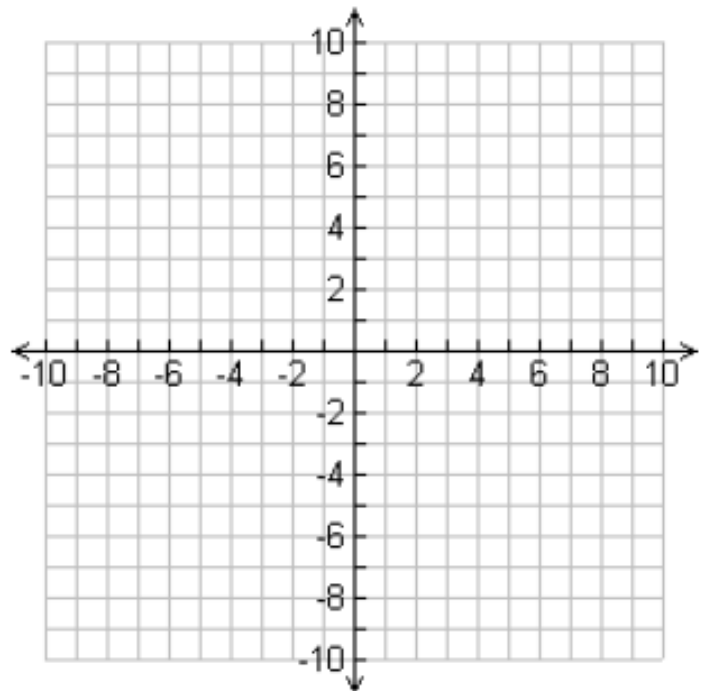
Degree: (circle) odd or even

Leading coefficient: positive or negative

End Behavior:

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



21.  $f(x) = x(x^2 + 4)$

Roots, including multiplicity:

\_\_\_\_\_

Degree of function: \_\_\_\_\_

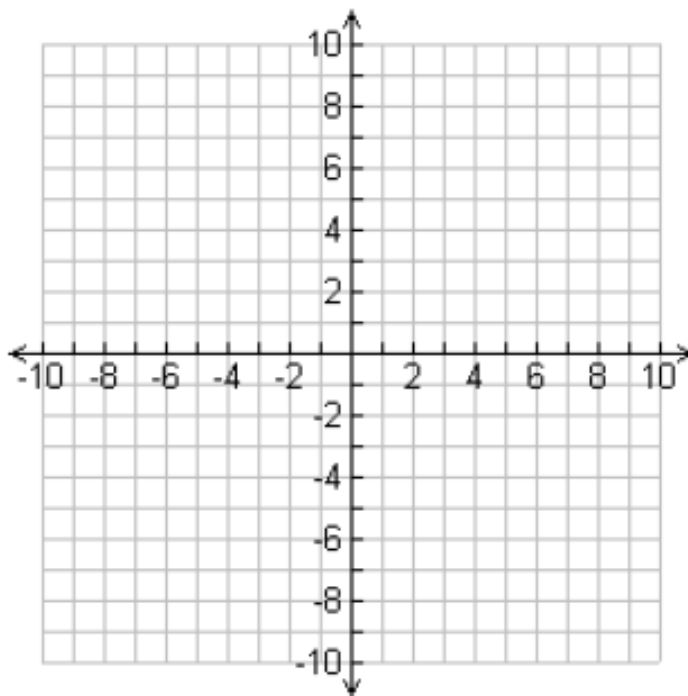
Degree: (circle) odd or even

Leading coefficient: positive or negative

End Behavior:

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



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

Roots, including multiplicity:

\_\_\_\_\_

Degree of function: \_\_\_\_\_

Degree: (circle) odd or even

Leading coefficient: positive or negative

End Behavior:

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.

