

Name Sweet

Date \_\_\_\_\_

1.  $f(x) = 5 - 3x^3 + 2x^4 - 4x$   
 Standard Form:  $2x^4 - 3x^3 - 4x + 5$   
 Leading Coefficient:  $2$   
 Constant:  $5$   
 Name by Degree: Quartic  
 Name by # of Terms: Polynomial

2. Give an example a quadratic binomial in standard form with a leading coefficient of 17 and a constant of -12, in function notation  
 $f(x) = 17x^2 - 12$

**Add/Subtract/Multiply/Binomial Expansion**

3.  $(2x - 7 + 3x^3) + (x^3 - 2x^2 + 5x)$   
 $4x^3 - 2x^2 + 7x - 7$

4.  $(4m^4 - 3m^2 + m - 5) - (2m^2 - 3m^4 - 3m + 1)$   
 $7m^4 - 5m^2 + 4m - 6$

5.  $(2x - 3)(x + 2)$   
 $2x^2 + x - 6$

6.  $(3z - 1)(z^2 + 2z - 3)$   
 $3z^3 + 5z^2 - 11z + 3$

7.  $(a + b)(a^2 + 2ab - b^2)$   
 $a^3 + 3a^2b + ab^2 - b^3$

8.  $2x^5(x^3 - 3x^2 + 7)$   
 $2x^8 - 6x^7 + 14x^5$

9.  $(x^2 + 4y)^4$   
 $x^8 + 16x^6y + 96x^4y^2 + 256x^2y^3 + 256y^4$

10.  $(2k - 3)^3$   
 $8k^3 - 36k^2 + 54k - 27$

11.  $(5x - 3)^5$   
 $3125x^5 - 9375x^4 + 11250x^3 - 6750x^2 + 2025x - 243$

12. An object is propelled straight up into the air with an initial velocity of 32 ft/sec. The height at any time  $t$  is given by  $s(t) = -16t^2 + 32t + 6$ . Find the maximum height of the object and the time it hits the ground.

Max height is 22 ft.

It will hit the ground in 2.17 secs.

\*Don't forget to review all methods of solving quadratics from unit 1\*

**Combine Functions**  $f(x) = x^2 - 3x + 4$

$g(x) = 2x + 1$

$h(x) = 3x^3 + 2x - 1$

13.  $3f(x) + 2g(x) - 4h(x)$

$$-12x^3 + 3x^2 - 13x + 18$$

14.  $4g(3) + h(-2)$

$$-1$$

15.  $g(x) \cdot f(x)$

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

16.  $f \circ g(x)$

$$4x^2 - 2x + 2$$

17.  $g(-2p+5) + 7$

$$-4p + 18$$

18.  $g(f(h(-1)))$

$$117$$

**Divide Polynomials**

19.  $(x^4 - 6x^3 - 40x + 33) \div (x - 7)$

$$x^3 + x^2 + 7x + 9 + \frac{96}{x-7}$$

20.  $(4x^4 - 15x^3 + 7x^2 - 1) \div (x^3 - x + 2)$

$$4x - 15 + \frac{11x^2 - 23x + 29}{x^3 - x + 2}$$

21.  $(x^3 + 2x^2 - 6x - 9) \div (x - 2)$

$$x^2 + 4x + 2 + \frac{-5}{x-2}$$

22.  $(6x^3 + 13x^2 - 5) \div (3x^2 + 2x)$

$$2x + 3 + \frac{-6x - 5}{3x^2 + 2x}$$

**Review: Solve using any method.**

23.  $5k^2 = -10k - 7$

$$k = -1 \pm \frac{i\sqrt{10}}{5}$$

24.  $-9p = -2p^2 + 110$

$$p = 10, -\frac{11}{2}$$

25.  $3x^2 + 29x = 0$

$$x = 0, -\frac{29}{3}$$