

Quiz # 7

1.  $a^2 - b^2 = (a-b)(a+b)$

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

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

4.  $a^2 + 2ab + b^2 = (a+b)^2$

5.  $a^2 - 2ab + b^2 = (a-b)^2$

6.  $8x^4y + 10x^2y^3 + 6x^2y$   
 $2x^2y(4x^2 + 5y^2 + 3)$

7.  $x^2 - 4x - 12$

$(x-6)(x+2)$

$$\begin{aligned} 8. & \underbrace{x^3 - x^2} + \underbrace{3x - 3} \\ & x^2(x-1) + 3(x-1) \\ & (x-1)(x^2 + 3) \end{aligned}$$

$$\begin{aligned} 9. & 4x^2 - 49 \\ & (2x)^2 - 7^2 \\ & (2x-7)(2x+7) \end{aligned}$$

$$\begin{aligned} 10. & 27y^3 - 64 \\ & (3y)^3 - 4^3 \\ & (3y-4)(9y^2 + 12y + 16) \end{aligned}$$

Bonus

$$3x^5 - 3x^3 + 24x^2 - 24$$

$$3(x^5 - x^3 + 8x^2 - 8)$$

$$3[x^3(x^2 - 1) + 8(x^2 - 1)]$$

$$3(x^2 - 1)(x^3 + 8)$$

$$3(x-1)(x+1)(x+2)(x^2 - 2x + 4)$$

Chapter Review

51. distance = rate x time

$$\text{time: } 2.2 \times 10^6 \text{ years}$$

$$\text{rate: } 5.9 \times 10^{12} \text{ mph}$$

$$d = 2.2 \times 10^6 \text{ years} \cdot \frac{5.9 \times 10^{12} \text{ miles}}{1 \text{ hour}} \cdot \frac{24 \text{ hours}}{1 \text{ day}} \cdot \frac{365 \text{ days}}{1 \text{ year}}$$

$$= (2.2 \times 10^6)(5.9 \times 10^{12})(24)(365) =$$

42. Factor.

$$36x^8 - 36x^4 + 5$$

$$(36)(5)$$

$$36x^8 - 30x^4 - 6x^4 + 5$$

$$\underline{6 \cdot 6 \cdot 5}$$

$$6x^4(6x^4 - 5) - 1(6x^4 - 5)$$

$$(6x^4 - 5)(6x^4 - 1)$$

34. Factor.

$$24x^2 + 61x - 8$$

$$8(24)$$

$$\underline{8 \cdot 8 \cdot 3}$$

$$24x^2 + 64x - 3x - 8$$

$$8x(3x + 8) - 1(3x + 8)$$

$$(3x + 8)(8x - 1)$$

$$48. \text{ Solve. } 6x^2 + 60 = 39x$$

$$6x^2 - 39x + 60 = 0$$

$$3(2x^2 - 13x + 20) = 0$$

$$3[2x^2 - 8x - 5x + 20] = 0$$

$$2(20) \\ 2 \cdot 5 \cdot 4$$

$$3[2x(x-4) - 5(x-4)] = 0$$

$$3(x-4)(2x-5) = 0$$

$$x-4=0 \quad 2x-5=0$$

$$x=4$$

$$2x=5$$

$$x = \frac{5}{2}$$

The remainder  $a$  when dividing a polynomial  $f(x)$  by  $x-b$  is  $f(b)$ . (Remainder Theorem)