

Chapter 9 Kuta Review (circle final answer)

Factor each completely.

1)  $5k^2 - 50k + 125$   
 $5(k^2 - 10k + 25)$   
 $5(k-5)(k-5)$   
 OR  $5(k-5)^2$

2)  $4n^2 + 56n + 196$   
 $4(n^2 + 14n + 49)$   
 $4(n+7)(n+7)$   
 OR  $4(n+7)^2$

3)  $-2b^2 + 32$   
 $-2(b^2 - 16)$   
 $-2(b-4)(b+4)$

4)  $-3n^2 + 51n - 210$   
 $-3(n^2 - 17n + 70)$   
 $-3(n-7)(n-10)$

1	70
2	35
5	14
7	10

5)  $15x^3 - 20x^2 - 6x + 8$   
 $5x^2(3x-4) - 2(3x-4)$   
 $(3x-4)(5x^2-2)$

6)  $24p^3 - 6p^2 - 96p + 24$   
 $6(4p^3 - p^2 - 16p + 4)$   
 $6[p^2(4p-1) - 4(4p-1)]$   
 $6(4p-1)(p^2-4)$   
 $6(4p-1)(p+2)(p-2)$

Keep factoring

7)  $-36x^2 + 84x$   
 $-12x(3x-7)$

8)  $8n^2 + n - 3$   
 $(-N \ 3)(-N \ 1)$

Cannot factor. answer

**PRIME**

9)  $-4a^2 + 12a - 9$   
 $-1(4a^2 - 12a + 9)$   
 $-1((2a-3)(2a-3))$   
 OR  
 $-1(2a-3)^2$

LEADING COEF IS NEGATIVE FACTOR (-1).

10)  $9x^2 - 76x + 32$

1	32
2	16
4	8

1	9
3	3

$(9x-4)(x-8)$

-72x

**$(9x-4)(x-8)$**

Solve each equation by factoring.

11)  $x^2 + 7x + 10 = 0$

$$(x+2)(x+5) = 0$$

$$x+2=0$$

$$x = -2$$

$$x+5=0$$

$$x = -5$$

12)  $2x^2 + 26x + 80 = 0$

$$2(x^2 + 13x + 40) = 0$$

$$2(x+5)(x+8) = 0$$

~~2=0~~  
NO SOLUTION

$$x+5=0$$

$$x = -5$$

$$x+8=0$$

$$x = -8$$

$$\begin{array}{r} 1 \ 4 \ 0 \\ 2 \ 2 \ 0 \\ 4 \ 1 \ 0 \\ \hline 5 \ 8 \end{array}$$

13)  $0 = 20 - 5n^2$

$$0 = -5n^2 + 20$$

$$0 = -5(n^2 - 4)$$

$$0 = -5(n-2)(n+2)$$

~~-5=0~~  
NO SOLUTION

$$n-2=0$$

$$n = 2$$

$$n+2=0$$

$$n = -2$$

14)  $3x^2 = -3x$

$$3x^2 + 3x = 0$$

$$3x(x+1) = 0$$

$$3x = 0$$

$$x = 0$$

$$C: 0 = 0 \checkmark$$

$$x+1=0$$

$$x = -1$$

$$C: 3 = 3 \checkmark$$

← To solve you must have the EQ = 0.

15)  $b^2 + 10b + 25 = 0$

$$(b+5)(b+5) = 0$$

$$(b+5)^2 = 0$$

$$b+5=0$$

$$b = -5$$

16)  $5b^2 - 15b - 20 = 0$

$$5(b^2 - 3b - 4) = 0$$

$$5(b+1)(b-4) = 0$$

~~5=0~~  
NO SOLUTION

$$b+1=0$$

$$b = -1$$

$$b-4=0$$

$$b = 4$$

$$\begin{array}{r} 1 \ 4 \\ 2 \ 2 \end{array}$$

17)  $r^2 - 4r + 4 = 0$

$$(r-2)(r-2) = 0$$

$$(r-2)^2 = 0$$

$$r-2=0$$

$$r = 2$$

18)  $3x^2 + 12x = 0$

$$3x(x+4) = 0$$

$$3x = 0$$

$$x = 0$$

$$x+4=0$$

$$x = -4$$

# COMBINE LIKE TERMS

Simplify each sum.

19)  $(3x^2 - x^3 - 1) + (1 - 3x^2 - 2x^3)$

$-3x^3$

20)  $(3x^4 - x^2 - 3x^3) + (-4x^4 - x^3 - 6)$

$-x^4 - 4x^3 - x^2 - 6$

Simplify each difference.

Subtraction

21)  $(-6x^2 - x^3 + 6x) - (8x^3 - 6 + 6x^2)$

• mult by (-1)  
• then add

22)  $(6x^4 - x - x^2) - (-x - 2x^4 + 8x^2)$

$-6x^2 - x^3 + 6x - 8x^3 + 6 - 6x^2$

$-9x^3 - 12x^2 + 6x + 6$

$6x^4 - x - x^2 + x + 2x^4 - 8x^2$

$8x^4 - 9x^2$

Find each product. MULTIPLY. REMEMBER  $x^2 \cdot x^3 = x^5$ .

23)  $-2x^2(-8x^2 - 5x - 5)$

$16x^4 + 10x^3 + 10x^2$

24)  $-8x(-2x^2 + 8x + 3)$

$16x^3 - 64x^2 - 24x$

25)  $(6x + 1)(7x^2 + 3x - 6)$

$42x^3 + 18x^2 - 36x + 7x^2 + 3x - 6 =$

$42x^3 + 25x^2 - 33x - 6$

26)  $(-4x - 5)(x^2 + x - 6)$

$-4x^3 - 4x^2 + 24x - 5x^2 - 5x + 30 =$

$-4x^3 - 9x^2 + 19x + 30$

27)  $(8x + 4)(2x - 5)$

$16x^2 - 40x + 8x - 20$  ← SIMPLIFY

$16x^2 - 32x - 20$

28)  $(5x + 5)(5x + 4)$

$25x^2 + 45x + 20$

29)  $(8x + 3)(4x - 8)$

$32x^2 - 52x - 24$

30)  $(-x - 6)(7x + 6)$

$-7x^2 - 6x - 42x - 36$

$-7x^2 - 48x - 36$

31)  $(5x + 7)(5x - 7)$

$25x^2 - 35x + 35x - 49$

$25x^2 - 49$

32)  $(7x + 4)(7x - 4)$

$49x^2 - 16$

33)  $(3x + 8)^2$

↓ rewrite

$(3x + 8)(3x + 8)$

$9x^2 + 48x + 64$

34)  $(3x - 5)^2$

↓ rewrite

$(3x - 5)(3x - 5)$

$9x^2 - 30x + 25$

Name each polynomial by **degree** and **number of terms**.

35)  $-10x$  **LINEAR MONOMIAL**

36)  $6 - 2x$  **LINEAR BINOMIAL**

37)  $3 + 7x^2$  **QUADRATIC BINOMIAL**

38)  $8x + 5x^3$  **CUBIC BINOMIAL**

39)  $-2$  **CONSTANT MONOMIAL**

40)  $4 - 8x^2 + 9x$  **QUADRATIC TRINOMIAL**

A football is kicked into the air with an initial upward velocity of 80ft/second.

41) When will the ball hit the ground?

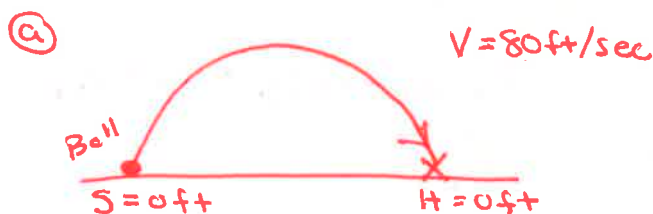
42) Calculate the height after 4 seconds.

- (a) Write the function model  
 (b) sketch and label the graph for BOTH problems; and  
 (c) find the time.

$T = 4$  seconds

$$h(4) = -16(4)^2 + 80(4) = 64$$

After 4 seconds the ball will be 64 feet in the air



(b)  $H = -16T^2 + 80T + 0$  OR  
 $h(t) = -16T^2 + 80T$

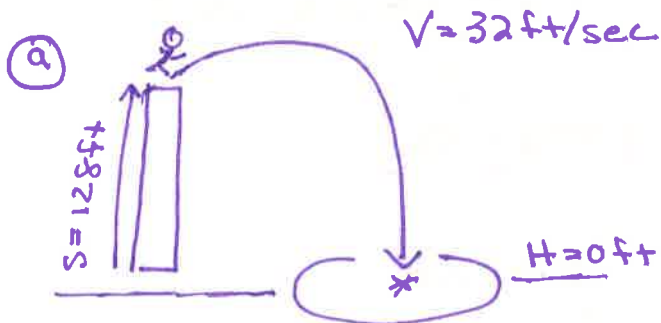
(c)  $0 = -16T(T - 5)$   
 $-16T = 0$        $T - 5 = 0$   
 $T = 0$              $T = 5$

The ball will hit the ground in 5 seconds

At the circus, a clown is fired into the air from a cannon on a platform into a tank 128 feet below the platform. The clown's initial velocity is 32 ft/sec. When will the clown land in the pool?

- 43) (a) Write the function model.  
 (b) sketch and label the graph.

44) Find the time. Clearly show your work.



$$0 = -16T^2 + 32T + 128$$

$$0 = -16(T^2 - 2T - 8)$$

$$0 = -16(T - 4)(T + 2)$$

$$T - 4 = 0 \quad T + 2 = 0$$

$$T = 4 \quad T = -2$$

The clown will hit the pool in 4 seconds.

(b)  $H = -16T^2 + 32T + 128$

OR

$$h(t) = -16T^2 + 32T + 128$$