

9.8 Practice A (Step 1 "Factor GCF")

Factor each completely.

1)  $-16x^2 + 28x$

$-4x(4x - 7)$

FACTOR GCF

① always factor out -1 when leading coef is Negative

② GCF for variables is the smallest exponent

2)  $9x^9 - 18x^4 - 18x^3$

$9x^3(x^6 - 2x - 2)$

**CHECKING:**  
ALWAYS mentally multiply to check!

3)  $5x^3 - 30x^2 + 40x$

$5x(x^2 - 6x + 8) = 5x(x-2)(x-4)$

18  
24

4)  $27x^4 - 12x^2$

$3x^2(9x^2 - 4) = 3x^2(3x+2)(3x-2)$

Special case  
PSQ - PSQ

5)  $5x^2 + 10x + 5 = 5(x^2 + 2x + 1)$

$5(x+1)^2 = 5(x+1)(x+1)$

OR

6)  $5x^3 - 40x^2 + 80x = 5x(x^2 - 8x + 16)$

$5x(x-4)^2 = 5x(x-4)(x-4)$

OR

116  
28  
14

7)  $-6n^3 + 66n^2 - 60n = -6n(n^2 - 11n + 10)$

$-6n(n-10)(n-1)$

$-6n(n-1)(n-10)$

ALWAYS FACTOR -1 WHEN LEADING COEF IS Negative

110  
25

8)  $-x^2 - 11x - 18 = -1(x^2 + 11x + 18)$

$-(x+2)(x+9)$

118  
29  
36

9)  $-6x^2 - 4x + 2 = -2(3x^2 + 2x - 1)$

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

10)  $6x^3 + 14x^2 - 12x = 2x(3x^2 + 7x - 6)$

$2x(3x-2)(x+3) =$

TIP: INCREASEN WRITE WHAT YOU KNOW

$2x(3x-2)(x+3)$

16  
23

Solve AND CHECK each equation by factoring.

Remember to solve POT IN:

$$Ax^2 + Bx + C = 0$$

11)  $2x^3 - 4x^2 - 6x = 0$

$$2x(x^2 - 2x - 3) = 0$$

$$2x(x-3)(x+1) = 0$$

$$2x = 0 \quad x-3 = 0 \quad x+1 = 0$$

$$x = 0 \quad x = 3 \quad x = -1$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

Check  
All solutions  
IN THE  
ORIG EQ.  
USE CALC  
TO DO  
THE  
WORK

12)  $3x^2 + 24x + 45 = 0$

$$3(x^2 + 8x + 15) = 0$$

$$3(x+3)(x+5) = 0$$

$$3 = 0 \quad x+3 = 0 \quad x+5 = 0$$

$$x = -3 \quad x = -5$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

13)  $3x^3 + 15x^2 + 18x = 0$

$$3x(x^2 + 5x + 6) = 0$$

$$3x(x+2)(x+3) = 0$$

$$3x = 0 \quad x+2 = 0 \quad x+3 = 0$$

$$x = 0 \quad x = -2 \quad x = -3$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

14)  $5x^2 - 25x + 20 = 0$

$$5(x^2 - 5x + 4) = 0$$

$$5(x-4)(x-1) = 0$$

$$5 = 0 \quad x-4 = 0 \quad x-1 = 0$$

$$x = 4 \quad x = 1$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

15)  $4x^2 + 4x - 24 = 0$

$$4(x^2 + x - 6) = 0$$

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

$$4 = 0 \quad x+3 = 0 \quad x-2 = 0$$

$$x = -3 \quad x = 2$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

16)  $-4x^3 + 20x^2 - 24x = 0$

$$-4x(x^2 - 5x + 6) = 0$$

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

$$-4x = 0 \quad x-2 = 0 \quad x-3 = 0$$

$$x = 0 \quad x = 2 \quad x = 3$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

17)  $5x^4 - 45x^2 = 0$

$$5x^2(x^2 - 9) = 0$$

$$5x^2(x-3)(x+3) = 0$$

$$5x^2 = 0 \quad x-3 = 0 \quad x+3 = 0$$

$$x = 0 \quad x = 3 \quad x = -3$$

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$

18)  $4x^3 + 16x^2 + 16x = 0$

$$4x(x^2 + 4x + 4) = 0$$

$$4x(x+2)(x+2) = 0$$

$$4x = 0 \quad x+2 = 0$$

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

$$C: 0 = 0 \checkmark \quad C: 0 = 0 \checkmark$$