

Chapter 9 Review (circle final answer)

Name each polynomial by degree (1st word) and number of terms (2nd word).

1) $-10x$ ¹

linear monomial

2) $6 - 2x$ ¹

linear binomial

3) $3 + 7x^2$ ²

quadratic binomial

4) $8x + 5x^3$ ³

cubic binomial

5) -2

constant monomial

6) $4 - 8x^2 + 9x$ ²

quadratic trinomial

Simplify each sum.

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

$-3x^3$

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

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

Simplify each difference. Step 1 - rewrite as an addition problem.

9) $(-6x^2 - x^3 + 6x) + (8x^3 - 6 + 6x^2)$

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

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

10) $(6x^4 - x - x^2) + (-x - 2x^4 + 8x^2)$

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

$8x^4 - 9x^2$

Factor. Remember to mentally multiply to check.

11) $x^2 + 2x - 15$

$\begin{matrix} 115 \\ 35 \end{matrix}$

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

12) $x^2 + x - 90$

$\begin{matrix} 190 \\ 245 \\ 330 \end{matrix}$

$(x - 9)(x + 10)$

$\begin{matrix} 518 \\ 615 \\ 910 \end{matrix}$

13) $x^2 - 10x + 25 =$

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

$(x - 5)^2$

14) $x^2 - 81 =$

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

PSQ - PSQ

15) $x^2 + 20x + 100 =$

$(x + 10)(x + 10)$

$(x + 10)^2$

16) $x^2 - 17x + 70 =$

$(x - 7)(x - 10)$

$\begin{matrix} 170 \\ 235 \\ 514 \\ 710 \end{matrix}$

Factor each completely. Remember: **Step 1 in factoring is to look for a GCF!!!**

17) $6x^2 - 24x + 24 = 6(x^2 - 4x + 4)$ $\begin{matrix} 1 & 4 \\ 2 & 2 \end{matrix}$ $\rightarrow 6(x-2)(x-2)$

18) $-4x^2 - 16x + 128 = -4(x^2 + 4x - 32)$ $\begin{matrix} 1 & 32 \\ 2 & 16 \end{matrix}$ $\rightarrow -4(x+8)(x-4)$

19) $5x^2 - 80 = 5(x^2 - 16) = 5(x-4)(x+4)$

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

21) $9x^2 + 21x - 18 = 3(3x^2 + 7x - 6)$ $\begin{matrix} 1 & 6 \\ 2 & 3 \end{matrix}$ $\rightarrow 3(3x-2)(x+3)$

22) $-4x^2 + 6x + 4 = -2(2x^2 - 3x - 2) = -2(2x+1)(x-2)$

Solve each equation by factoring. Remember to use your calculator to check in the original equation!

23) $x^2 - 7x = 0$
 $x(x-7) = 0$
 $x=0$
 $x-7=0$
 $x=7$
 C: $0=0$ ✓

24) $x^2 - 10x + 25 = 0$
 $(x-5)(x-5) = 0$
 $x-5=0$
 $x=5$
 C: $0=0$ ✓

25) $5x^2 + 15x - 52 = 0$ $\begin{matrix} 0 \\ +2 & +2 \end{matrix}$ $\rightarrow 5x^2 + 15x - 50 = 0$

26) $4x^2 - 105 = 0$ $\begin{matrix} 0 \\ +5 & +5 \end{matrix}$ $\rightarrow 4x^2 - 100 = 0$

① PUT INTO $Ax^2 + Bx + C = 0$

② FACTOR GCF

③ FACTOR

④ SET FACTORS = 0 AND SOLVE

⑤ Check all solutions in orig. eq. USE CALC!

For 25: $5(x+5)(x-2) = 0$
 $x+5=0 \rightarrow x=-5$
 $x-2=0 \rightarrow x=2$
 C: $-2 = -2$ ✓

For 26: $4(x-5)(x+5) = 0$
 $x-5=0 \rightarrow x=5$
 $x+5=0 \rightarrow x=-5$
 C: $-5 = -5$ ✓

$$27) x^2 - 9x + 20 = 0$$

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

$$x-4=0$$

$$x=4$$

$$C: 0=0 \checkmark$$

$$x-5=0$$

$$x=5$$

$$C: 0=0 \checkmark$$

$$28) 4x^2 - 28x + 40 = 0$$

$$4(x^2 - 7x + 10) = 0$$

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

$$x-2=0$$

$$x=2$$

$$C: 0=0 \checkmark$$

$$x-5=0$$

$$x=5$$

$$C: 0=0 \checkmark$$

$$29) 5x^3 - 35x^2 + 80x = 20x$$

$$\begin{array}{r} 0 \\ \hline 5x^3 - 35x^2 + 60x = 0 \end{array}$$

$$5x(x^2 - 7x + 12) = 0$$

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

$$5x=0$$

$$x=0$$

$$C: 0=0 \checkmark$$

$$x-3=0$$

$$x=3$$

$$C: 60=60 \checkmark$$

$$x-4=0$$

$$x=4$$

$$C: 80=80 \checkmark$$

Solve each equation by factoring. Check in the original equation!

$$30) 2x^2 + 6 = -7x$$

$$\begin{array}{r} 0 \\ \hline 2x^2 + 7x + 6 = 0 \end{array} \quad \begin{array}{r} 16 \\ 23 \end{array}$$

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

$$2x+3=0$$

$$x = -\frac{3}{2}$$

$$C: 10.5 = 10.5 \checkmark$$

$$x+2=0$$

$$x = -2$$

$$C: 14 = 14 \checkmark$$

$$31) 5x^2 - 3 = -2x$$

$$\begin{array}{r} 0 \\ \hline 5x^2 + 2x - 3 = 0 \end{array}$$

$$(5x-3)(x+1) = 0$$

$$5x-3=0$$

$$x = \frac{3}{5}$$

$$C: -1.2 = -1.2 \checkmark$$

$$x+1=0$$

$$x = -1$$

$$C: 2 = 2 \checkmark$$

$$32) 5x^3 + 15x^2 - 45x = 5x$$

$$\begin{array}{r} 0 \\ \hline 5x^3 + 15x^2 - 50x = 0 \end{array}$$

$$5x(x^2 + 3x - 10) = 0$$

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

$$5x=0$$

$$x=0$$

$$C: 0=0 \checkmark$$

$$x+5=0$$

$$x = -5$$

$$C: -25 = -25 \checkmark$$

$$x-2=0$$

$$x=2$$

$$C: 10 = 10 \checkmark$$

Find each product. Remember to write answers in standard form (high to low exponents with the constant last.)

33) $2x^3(7x^2 - 6x - 1)$

$14x^5 - 12x^4 - 2x^3$

34) $-8x(6x^2 - 4x - 6)$

$-48x^3 + 32x^2 + 48x$

35) $(4x - 8)(8x^2 + 6x + 3)$

$32x^3 + 24x^2 + 12x +$
 $-64x^2 - 48x - 24 =$

$32x^3 - 40x^2 - 36x - 24$

36) $(4x - 8)(2x^2 + 4x - 7)$

$8x^3 + 16x^2 - 28x +$
 $-16x^2 - 32x + 56$

$8x^3 - 16x + 56$

37) $(3x + 2)(3x - 3)$

$9x^2 - 9x + 6x - 6 =$

$9x^2 - 3x - 6$

38) $(2x - 4)(4x + 3)$

$8x^2 + 6x - 16x - 12 =$

$8x^2 - 10x - 12$

39) $(5x + 7)(5x - 7)$

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

$25x^2 - 49$

40) $(7x + 4)(7x - 4)$

$49x^2 - 28x + 28x - 16 =$

$49x^2 - 16$

41) $(3x + 8)^2$ expand

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

$9x^2 + 24x + 24x + 64 =$

$9x^2 + 48x + 64$

42) $(3x - 5)^2$ expand

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

$9x^2 - 15x - 15x + 25 =$

$9x^2 - 30x + 25$