

Section 5.1

5.1 LI

Note: we can only add or subtract like terms

Do Not mix rules for multiplying/dividing
when adding/subtracting {also, reversed}.

2) a) $x^2 - y^2$ binomial
degree: 2

b) $-13c^4$ monomial
degree: 4

c) $a^2 + 2ab - 7b^2$ trinomial
degree: 2

d) $4x^2y^2 - 3xy + 8$ trinomial
degree: 4

e) 19 monomial
degree: 0

4) a) $11y^2$ monomial
degree: 2

b) -73 monomial
degree: 0

c) $6x^2 - 3xy + 4x - 2y + y^2$ polynomial
degree: 2

d) $4y^2 + 17z^2$ binomial
degree: 2

e) $5c^3 + 11c^2 - c - 8$ polynomial
degree: 3

6) a) $9y^3 - 10y^2 + 2y - 6$ polynomial
degree: 3

b) $-12p^3q$ monomial
degree: 4

c) $a^2 + 9ab + 18b^2$ trinomial
degree: 2

d) $20x^2y^2 - 10a^2b^2 + 30$ trinomial
degree: 4

e) 17 monomial
degree: 0

8) a) $15xy$ monomial
degree: 2

b) 15 monomial
degree: 0

c) $6x^2 - 3xy + 4x - 2y + y^2$
polynomial
degree: 2

d) $10p - 9q$ binomial
degree: 1

e) $m^4 + 4m^3 + 6m^2 + 4m + 1$
polynomial
degree: 4

$$10-a) 4y^3 + 6y^3 = \underline{\underline{10y^3}}$$

$$10-b) -y - 5y = \underline{\underline{-6y}}$$

$$12-a) -3m + 9m = \underline{\underline{6m}}$$

$$12-b) 15yz^2 - (-8yz^2) = 15yz^2 + 8yz^2 \\ = \underline{\underline{23yz^2}}$$

$$14) 4y^3 + 6y^3 - y - 5y = \underline{\underline{10y^3 - 6y}}$$

$$16) -3m + 9m + 15yz^2 - (-8yz^2) = 6m + 15yz^2 + 8yz^2 = \underline{\underline{6m + 23yz^2}}$$

$$18-a) -10x - 35x = \underline{\underline{-45x}}$$

$$18-b) 3xy - (-8xy) + 5xy \\ = 3xy + 8xy + 5xy = \underline{\underline{16xy}}$$

$$20-a) 14x - 3y - 13x = \underline{\underline{x - 3y}}$$

$$20-b) \underline{\underline{a^2b - 4a - 5ab^2}}$$

$$22-a) 5u^2 + 4v^2 - 6u^2 = \underline{\underline{4v^2 - u^2}}$$

$$22-b) \underline{\underline{12a + 8b}}$$

$$24) 12a + 5b - 22a + pq^2 - 4p - 3q^2 = \underline{\underline{-10a + 5b + pq^2 - 4p - 3q^2}}$$

$$26) 2a^2 + b^2 - 6a^2 + x^2y - 3x + 7xy^2 = \underline{\underline{-4a^2 + b^2 + x^2y - 3x + 7xy^2}}$$

$$28) \underline{\underline{xy^2 - 5x - 5y^2 + 19y + 5z}}$$

$$30) (4x) + (3y) + (-3x) = \underline{\underline{x + 3y}}$$

$$32) (-7p^4) - (2p^4) = \underline{\underline{-9p^4}}$$

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$$34) (4y^2 + 10y + 3) + (8y^2 - 6y + 5) = 4y^2 + 10y + 3 + 8y^2 - 6y + 5 \\ = \underline{\underline{12y^2 + 4y + 8}}$$

$$36) (y^2 + 9y + 4) + (-2y^2 - 5y - 1) = y^2 + 9y + 4 - 2y^2 - 5y - 1 = \underline{\underline{-y^2 + 4y + 3}}$$

$$38) (7x^2 - 9x + 2) + (6x^2 - 4) = 7x^2 - 9x + 2 + 6x^2 - 4 = \underline{\underline{13x^2 - 9x - 2}}$$

$$40) (p^2 - 6p - 18) + (2p^2 + 11) = p^2 - 6p - 18 + 2p^2 + 11 = \underline{\underline{3p^2 - 6p - 7}}$$

$$42) (3b^2 - 4b + 1) - (5b^2 - b - 2) \\ = 3b^2 - 4b + 1 - 5b^2 + b + 2 \\ = \underline{\underline{-2b^2 - 3b + 3}}$$

$$44) (b^2 - 7b + 5) - (b^2 - 2b + 9) \\ = b^2 - 7b + 5 - b^2 + 2b - 9 \\ = \underline{\underline{-5b - 4}}$$

$$46) (10n^2 - 20n) - (n - 8) \\ = 10n^2 - 20n - n + 8 \\ = \underline{\underline{10n^2 - 21n + 8}}$$

$$48) (10y^2 - 8y - 20) - (5y^2 - y + 12) \\ = 10y^2 - 8y - 20 - 5y^2 + y - 12 \\ = \underline{\underline{5y^2 - 7y - 32}}$$

$$50) (9x^2 - 6x - 20) - (5x^2 - x + 12) \\ = 9x^2 - 6x - 20 - 5x^2 + x - 12 \\ = \underline{\underline{4x^2 - 5x - 32}}$$

$$52) (z^2 - 3z - 18) - (z^2 + 5z - 20) \\ = z^2 - 3z - 18 - z^2 - 5z + 20 \\ = \underline{\underline{-8z + 2}}$$

$$\begin{aligned}
 54) & (-5x^2 - 4xy - 3y^2) + (2x^2 - 7xy) \\
 &= -5x^2 - 4xy - 3y^2 + 2x^2 - 7xy \\
 &= \underline{\underline{-3x^2 - 11xy - 3y^2}}
 \end{aligned}$$

$$\begin{aligned}
 56) & (2n^2 - 3n^2 - 2n^2) + (5n^2 - 3n^2) \\
 &= 2n^2 - 3n^2 - 2n^2 + 5n^2 - 3n^2 \\
 &= \underline{\underline{7n^2 - 6n^2 - 2n^2}}
 \end{aligned}$$

$$\begin{aligned}
 58) & (m^2 + 2n^2) - (m^2 - 8mn - n^2) \\
 &= m^2 + 2n^2 - m^2 + 8mn + n^2 \\
 &= \underline{\underline{3n^2 + 8mn}}
 \end{aligned}$$

$$\begin{aligned}
 60) & (a^3 - 2a^2b) + (ab^2 + b^3) - (3a^2b + 4ab^2) \\
 &= a^3 - 2a^2b + ab^2 + b^3 - 3a^2b - 4ab^2 \\
 &= \underline{\underline{a^3 - 5a^2b - 3ab^2 + b^3}}
 \end{aligned}$$

$$\begin{aligned}
 62) & (x^3 - 2x^2y) - (xy^2 - 3y^3) - (x^2y - 4xy^2) \\
 &= x^3 - 2x^2y - xy^2 + 3y^3 - x^2y + 4xy^2 \\
 &= \underline{\underline{x^3 - 3x^2y + 3xy^2 + 3y^3}}
 \end{aligned}$$

$$64) f(x) = 5x^2 - x - 7$$

$$a) f(-4) = 5(-4)^2 - (-4) - 7 = 5(16) + 4 - 7 = 80 + 4 - 7 = 84 - 7 = \underline{\underline{77}}$$

$$b) f(1) = 5(1)^2 - (1) - 7 = 5(1) - 1 - 7 = 5 - 8 = \underline{\underline{-3}}$$

$$c) f(0) = 5(0)^2 - (0) - 7 = \underline{\underline{-7}}$$

$$66) g(x) = 16 - 36x^2$$

$$a) g(-1) = 16 - 36(-1)^2 = 16 - 36(1) = 16 - 36 = \underline{\underline{-20}}$$

$$b) g(0) = 16 - 36(0)^2 = 16 - 0 = \underline{\underline{16}}$$

$$c) g(2) = 16 - 36(2)^2 = 16 - 36(4) = 16 - 144 = \underline{\underline{-128}}$$

$$68) h(t) = -16t^2 + 200$$

$$h(3) = -16(3)^2 + 200 = -16(9) + 200 = -144 + 200 = \underline{\underline{56 \text{ ft}}}$$

$$70) R(p) = -4p^2 + 420p$$

$$\begin{aligned} R(90) &= -4(90)^2 + 420(90) = -4(8100) + 37800 \\ &= -32400 + 37800 = \underline{\underline{5400}} \end{aligned}$$

$$74) f(x) = 4x^2 - 7x + 3 \quad g(x) = 4x^2 + 2x - 1$$

$$\begin{aligned} a) (f+g)(x) &= f(x) + g(x) = \{4x^2 - 7x + 3\} + \{4x^2 + 2x - 1\} \\ &= 4x^2 - 7x + 3 + 4x^2 + 2x - 1 = \underline{\underline{8x^2 - 5x + 2}} \end{aligned}$$

$$\begin{aligned} b) (f+g)(2) &= f(2) + g(2) = \{4(2)^2 - 7(2) + 3\} + \{4(2)^2 + 2(2) - 1\} \\ &= \{16 - 14 + 3\} + \{16 + 4 - 1\} = \{5\} + \{19\} = \underline{\underline{24}} \end{aligned}$$

$$\begin{aligned} c) (f-g)(x) &= f(x) - g(x) = \{4x^2 - 7x + 3\} - \{4x^2 + 2x - 1\} \\ &= 4x^2 - 7x + 3 - 4x^2 - 2x + 1 \\ &= \underline{\underline{-9x + 4}} \end{aligned}$$

$$\begin{aligned} d) (f-g)(-3) &= f(-3) - g(-3) = \{4(-3)^2 - 7(-3) + 3\} - \{4(-3)^2 + 2(-3) - 1\} \\ &= \{36 + 21 + 3\} - \{36 - 6 - 1\} \\ &= \{60\} - \{29\} = \underline{\underline{-31}} \end{aligned}$$

$$76) f(x) = 5x^3 - x^2 + 3x + 4 \quad g(x) = 8x^3 - 1$$

$$\begin{aligned} a) (f+g)(x) &= f(x) + g(x) = \{5x^3 - x^2 + 3x + 4\} + \{8x^3 - 1\} \\ &= 5x^3 - x^2 + 3x + 4 + 8x^3 - 1 \\ &= \underline{\underline{13x^3 - x^2 + 3x + 3}} \end{aligned}$$

$$\begin{aligned} b) (f+g)(2) &= f(2) + g(2) = \{5(2)^3 - (2)^2 + 3(2) + 4\} + \{8(2)^3 - 1\} \\ &= \{40 - 4 + 6 + 4\} + \{64 - 1\} \\ &= \{46\} + \{63\} = \underline{\underline{109}} \end{aligned}$$

$$\begin{aligned} c) (f-g)(x) &= f(x) - g(x) = \{5x^3 - x^2 + 3x + 4\} - \{8x^3 - 1\} \\ &= 5x^3 - x^2 + 3x + 4 - 8x^3 + 1 \\ &= \underline{\underline{-3x^3 - x^2 + 3x + 5}} \end{aligned}$$

$$\begin{aligned} d) (f-g)(-3) &= f(-3) - g(-3) = \{5(-3)^3 - (-3)^2 + 3(-3) + 4\} - \{8(-3)^3 - 1\} \\ &= \{-135 - 9 - 9 + 4\} - \{-216 - 1\} \\ &= \{-149\} - \{-217\} \\ &= -149 + 217 = \underline{\underline{68}} \end{aligned}$$