MTH 28.5, First Review

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Evaluating Expressions

1. Evaluate the following expressions:

    (a) $-2 - 7 \cdot 3$.

    (b) $14 \div 7 \cdot (4 - 2) - 4$.

    (c) $2 - 3\,(3 - 5)$.

    (d) $2 - 3\,|3 - 5|$.

    (e) $-5^2 + 5^2$.

    (f) $(-5)^2 + 5^2$.

    (g) $(2 - 5)^2 - 3\,(2 - (-5 - 1))$.

    (h) $|7 - 9| + 2$.

    (i) $-3^2 + |3(2 - 5) - |3 - 2| + 2| + 11$.

    (j) $3 - \dfrac{2 - (-3)(-6)}{(-2)^2} + 3(7 - 2)$.

2. Evaluate the following expressions:

    (a) $\dfrac{2}{3}\left(\dfrac{3}{4} - 1\right) + \dfrac{5}{6}$.

    (b) $\dfrac{\dfrac{2}{3} - \dfrac{1}{2}}{\dfrac{1}{4} + \dfrac{1}{3}}$.

    (c) $\dfrac{3}{5}\left(-\dfrac{10}{21}\right)\left(-\dfrac{35}{4}\right)$.

Solving Linear Equations

1. Solve each of the following equations:

    (a) $-5x + 7 = 0$.

    (b) $11x - 8 = -8$.

    (c) $\dfrac{1}{2}x - 2 = -3$.

    (d) $2x - 7 = 5x + 8$.

    (e) $-2x + \dfrac{5}{2} = 5x - 1$.

(f) $-5(-2x+6)+9 = -3(x+11)+13x$.

(g) $3(5-2x) = 4x-7$.

(h) $2(5x+10)-3x = -2(x+8)$.

(i) $4(-3x+1)+2 = -12x+6$.

(j) $\dfrac{2x-3}{4}+\dfrac{x}{3}=\dfrac{1}{6}$.

(k) $\dfrac{3x-6}{5}-7x=\dfrac{7x+1}{5}-17$.

(l) $3(-5x+8)-3 = 2(x-5)-17x+11$.

(m) $\dfrac{4-x}{5}+3x+2=\dfrac{5x-3}{3}+2x+12$.

(n) $3(2x-1)+4x = 6x-1$.

(o) $\dfrac{x-3}{4}-\dfrac{x+6}{3}=1-\dfrac{4x}{3}$.

Polynomials

1. Perform the following operations. Your answer should be a polynomial in simplified expanded form with terms arranged in order according to their degrees starting with the term of the highest degree.

   (a) $(-5x^4+2x^3-3x^2-4x+3)+(7x^4+6x^3-2x^2+8x+3)$.

   (b) $2x^2-(2x^2-1)$.

   (c) $(x^2-3x-21)-(-2x^2-5x-14)$.

   (d) $7xy^2-8x^2y-(5x^2y-3xy^2-5)$.

   (e) $-(3x^5-2x^4+2x^2-9)+(5x^4-2x^3-2x^2-3)-(-3x^2-3x-1)$.

   (f) $-((x^2-5x+7)-(3x^2+5x+7))$.

2. Simplify:

   (a) $-2x^3y^5\left(-5x^4y^3\right)$.

   (b) $(-3xy)^2$.

   (c) $\left(-2x^2y\right)^3$.

   (d) $\left(5p^2\right)^3(3p)^2$.

   (e) $\left(-4p^2q^3\right)^2\left(9p^4q^8\right)$.

3. Perform the following operations. Your answer should be a polynomial in simplified expanded form with terms arranged in order according to their degrees starting with the term of the highest degree.

   (a) $-2x(x^3+4x^2-5x-21)$.

   (b) $(a-2)(a+2)$.

   (c) $(x+2)(x-7)$.

   (d) $(2x-3y)(2x+3y)$.

(e) $(x - 8)(x + 1)$.

(f) $(2x - 3)(3x + 7)$.

(g) $(x^2 - 4)(x^2 + 4)$.

(h) $(3x - y)(4x - 3y)$.

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

(j) $(x - 2)(x^2 + 2x + 4)$.

(k) $(x + 3)(x^2 - 3x + 9)$.

(l) $(x + 2)(x^4 - 2x^3 + 4x^2 - 8x + 16)$.

(m) $x(3x^2 - 7)(x - 2)$.

(n) $(x - 1)(x + 1)(x + 2)$.

(o) $(a - 1)(a + 1)(a^2 + 1)$.

(p) $(x + 2)(x + 2)$.

(q) $(3x - 5y)(3x + 5y)$.

4. Use the *special products* identities to simplify.

(a) $(x - 2)^2$.

(b) $(2x + 3)^2$.

(c) $(3x - 5y)^2$.

(d) $(x - 3)(x + 3)$.

(e) $(2x - 5y)(2x + 5y)$.

(f) $(x^2 + 2)(x^2 - 2)$.

5. Simplify as much as possible:

(a) $-x(3x - 5) + (x + 3)(2x - 5)$.

(b) $(x + 2)^2 + 3x(x - 1)$.

(c) $(x + 3)^2 + (x - 3)^2$.

(d) $(2x + 5)^2 - (2x - 5)^2$.

(e) $(x^2 + 1)(x - 2) - (x + 3)(2x^2 - 5x + 4)$.