When working with polynomials, it is important to understand what the definition of <u>like terms</u> is. You might want to review Section 1.7 Combining Like Terms.

Questions

1. State the degree of the polynomial $5xy^2 - 3x^2y^3$, and whether it is a monomial, binomial, or trinomial.

2. State the degree of the polynomial $7x^3y + 5x^4y^4$, and whether it is a monomial, binomial, or trinomial.

3. Subtract $(2x - 19) - (-3x + 5)$.

4. Subtract $\left(\frac{3}{8}x^2 - \frac{2}{3}x - 7\right) - \left(\frac{2}{3}x^2 - \frac{1}{2}x + 2\right)$.

5. Simplify $(3x^4 - 4x^2 - 18) - (2x^4 + 3x^3 + 6)$.

6. Simplify $(2b^3 + 3b - 5) - (-3b^3 + 5b^2 + 7b)$.

7. The lengths and widths of three rectangles are labeled below. Create a polynomial that describes the the sum of the area of these three rectangles.
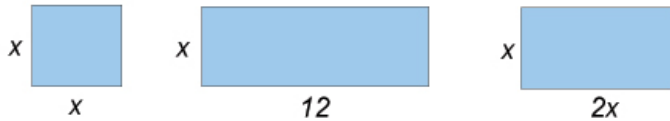
8. The dimensions of the sides of the following figure are labeled. Create a polynomial that describes the perimeter of the figure.
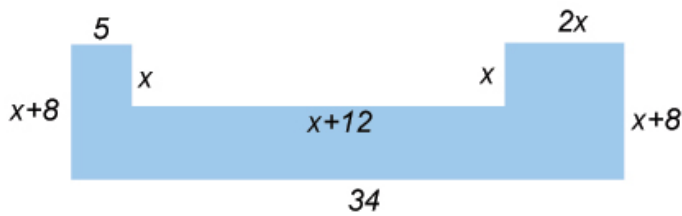
Solutions

1. Two terms, so it is a binomial. Degree is 5, since term $3x^2y^3$ has sum of exponents of the variables which is 5 (other term has smaller sum of exponents).

2. Two terms, so it is a binomial. Degree is 8, sin ce term $5x^4y^4$ has sum of exponents of the variables which is 8 (largest sum for all terms).

3. $(2x - 19) - (-3x + 5) = 2x - 19 + 3x - 5 = 5x - 24$

4.

$$\left(\frac{3}{8}x^2 - \frac{2}{3}x - 7\right) - \left(\frac{2}{3}x^2 - \frac{1}{2}x + 2\right) = \frac{3}{8}x^2 - \frac{2}{3}x - 7 - \frac{2}{3}x^2 + \frac{1}{2}x - 2 \text{ distribute}$$
$$= \left(\frac{3}{8} - \frac{2}{3}\right)x^2 + \left(-\frac{2}{3} + \frac{1}{2}\right)x + (-7 - 2) \text{ collect like terms}$$
$$= \left(\frac{9}{24} - \frac{16}{24}\right)x^2 + \left(-\frac{4}{6} + \frac{3}{6}\right)x - 9 \text{ common denominator to add fractions}$$
$$= \left(-\frac{7}{24}\right)x^2 + \left(-\frac{1}{6}\right)x - 9 \text{ simplify}$$

5. $(3x^4 - 4x^2 - 18) - (2x^4 + 3x^3 + 6) = 3x^4 - 4x^2 - 18 - 2x^4 - 3x^3 - 6 = x^4 - 3x^3 - 4x^2 - 24$

6. $(2b^3 + 3b - 5) - (-3b^3 + 5b^2 + 7b) = 2b^3 + 3b - 5 + 3b^3 - 5b^2 - 7b = 5b^3 - 5b^2 - 4b - 5$

7. Area $= x^2 + 12x + (2x)x = 3x^2 + 12x$.

8. Perimeter $= 34 + x + 8 + 2x + x + x + 12 + x + 5 + x + 8 = 7x + 67$.