Problem Set 14

1. Graph the lines $y = -\frac{2}{3}x + 1$ and $x + y = 3$ in the same coordinate system. Use your graph to find the coordinatesof point where the lines intersect each other.

2. Rationalize the denominator in each of the following expressions.

   a) $\frac{2\sqrt{3}}{\sqrt{7}}$ b) $\frac{1}{\sqrt{2}-3}$ c) $\frac{3}{\sqrt{10}-2}$

3. Completely factor each of the following.

   a) $(3a+1)^2 - 49$ b) $200x + 2x^3$ c) $5x^6 - 80x^2$

4. Simplify each of the following.

   a) $\frac{4x^2-16}{4x^2-8x}$

   b) $\frac{3a^3-3a^2}{5a^3-5a} \cdot \frac{5a^2+5a}{6a^2}$

   c) $\frac{5}{x-2} - \frac{8}{x}$

   d) $\frac{4}{m} - \frac{m}{4}$

   e) $\frac{30-\sqrt{24}}{6}$

   f) $\sqrt{12x^5} - \sqrt{75x^5} + \sqrt{300x^5}$

   g) $\frac{(2a^2b)^3(-2ab^3)^3}{(-2a^4b^5)^2}$

   h) $\frac{1}{(3\sqrt{2}-4)^2}$

5. Solve:

   a) $(x+2)^2 - (x-2)^2 = x(x-8)$

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

   c) $(2x-1)^2 - 5(x^2-2x) = 6x$

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

   e) $\frac{1}{3}(x+2) - \frac{3}{4}(3x-1) + x = -\frac{x+3}{2}$

6. The opposite of a number is thirty-five more than the sum of -5 and the number. Find this number.

7. We have some \$5 bills and some \$10 bills. The number of \$5 bills is ten less than six times the number of \$10. How many \$5 bills do we have if the value of all bills is \$430?

8. Find all numbers with the following property: if we multiply the number by seven, the result is the original number.

9. Find all numbers with the following property: if we square the number, the result is the original number.

10. Find all numbers with the following property: if we raise the number, to the third power, the result is the original number.