Preliminary Review Problems

Math 130 *Kovitz* 2012

1. Subtract. $(5x^2 - 8x + 1) - (8x^2 - 2x + 6)$
2. Multiply. $-3a^2(a^2 - 4a + 5)$
3. Multiply:
   (a) $(6x - 1)(2x + 5)$.
   (b) $(2a - 7)^2 - 30$.
4. Divide. $\dfrac{72x^3 - 32x^2 + 8x}{8x}$
5. Factor.
   (a) $3x^2 - 75$
   (b) $9x^2 - 30x + 25$
   (c) $x^2 + x - 12$
   (d) $12x^2 - 17x - 40$
6. True or false?
   (a) $(-2)(-3) = -(2)(3)$
   (b) $\dfrac{-5}{-6} = -\left(\dfrac{5}{6}\right)$
7. Simplify.
   (a) $\dfrac{ab - b^2}{5ab - 5a^2}$
   (b) $\dfrac{x-2}{x-3} \cdot \dfrac{x^2 - 6x + 9}{x^2 - 4}$
   (c) $\dfrac{x-1}{x^2+4} \div \dfrac{x^2-1}{x+2} + \dfrac{1}{x+1}$
   (d) $\dfrac{2x + y}{x + 2y} + \dfrac{x + 5y}{x + 2y}$
   (e) $\dfrac{x}{x-3} - \dfrac{x-7}{x-1} - \dfrac{1}{2}$
   (f) $\dfrac{x}{x-1} - \dfrac{x^2}{x+3}$
   (g) $\dfrac{a^2 - 5}{a - b} + \dfrac{b^2 - 5}{b - a}$
   (h) $\dfrac{1-x}{x+2} + \dfrac{x-1}{x-2}$
   (i) $1 + \dfrac{1}{\frac{1}{x} + \frac{1}{3}}$

8. Solve for x.
   (a) $\dfrac{2}{7} + \dfrac{6}{x-1} = \dfrac{x}{21}$.
   (b) $\dfrac{20}{x} + \dfrac{15}{x-7} = 7$.
   (c) $\dfrac{1}{\frac{1}{x} + \frac{1}{3}} = 7$.
   (d) $\dfrac{1}{\frac{1}{x} + \frac{1}{3}} = \dfrac{1}{7}$.
   Is this answer just the reciprocal of the previous answer?
9. Solve for x. $2x + 5(x-7) = 59 - (3x+1)$.
10. Solve for x. (real number solutions only)
    (a) $2x^2 - 14x = 0$
    (b) $x^2 - 22x = 11$
    (c) $x^2 - 5x - 84 = 0$
    (d) $x^2 + x - 1 = 0$
    (e) $x^2 - x + 1 = 0$
    (f) $5x^2 - x - 4 = 0$
11. Solve for x.
    (a) $\sqrt{2x+3} = 3$
    (b) $|x-3| = 8$
    (c) $2 \geq |x-7|$
    (d) $x^3 - 3x^2 \geq 10x$
    (e) $\dfrac{x-3}{x^2-4} \geq 0$