Math 103
Exam #3
Summer '09

Name:

1. [10 pts. each] Solve each equation.

   (a) $x^2 + 80 = 18x$

   (b) $-3m^2 + 27m = 0$

   (c) $(3x + 2)(x - 3) = 7x - 1$

   (d) $2r^3 + 5r^2 - 2r - 5 = 0$

2. [10 pts. each] Write each rational expression in lowest terms.

   (a) $\dfrac{5y^2(y+8)}{15y(y-8)}$

   (b) $\dfrac{12x^2 - 4x - 5}{8x^2 - 6x - 5}$

   (c) $\dfrac{(a-3)(x+y)}{(3-a)(x-y)}$

3. [10 pts. each] Multiply or divide as indicated.

   (a) $\dfrac{a^4}{5b^2} \cdot \dfrac{25b^5}{a^3}$

   (b) $\dfrac{k^2 - 4}{3k^2} \div \dfrac{2-k}{11k}$

4. [10 pts. each] Add or subtract as indicated. Write all answers in lowest terms.

   (a) $\dfrac{5x+6}{x^2+x-20} + \dfrac{4-3x}{x^2+x-20}$

   (b) $\dfrac{4t}{9a^8b^7} + \dfrac{5s}{27a^4b^3}$

   (c) $\dfrac{1}{x+1} - \dfrac{1}{x-1}$

   (d) $\dfrac{5x}{x+3} + \dfrac{x+2}{x} - \dfrac{6}{x^2+3x}$

5. [10 pts.] Simplify $\dfrac{y - \dfrac{y-3}{3}}{\dfrac{4}{9} + \dfrac{2}{3y}}$

6. [10 pts. each] Solve each equation.

   (a) $\dfrac{6}{5x} + \dfrac{8}{45} = \dfrac{2}{3x}$

   (b) $\dfrac{3}{x-2} + \dfrac{21}{x^2-4} = \dfrac{14}{x+2}$

   (c) $\dfrac{5}{x-4} - \dfrac{3}{x-1} = \dfrac{x^2-1}{x^2-5x+4}$

7. [10 pts.] Solve the formula for r: $I = \dfrac{nE}{R+nr}$.

8. [15 pts.] On his drive from Tiny Town to Big City, Sebastian Funnypants averaged 52 mph. If he had been able to average 65 mph, he would have reached his destination 3 hours earlier. What is the driving distance between Tiny Town and Big City?

9. [15 pts.] Working alone, Farmer Boomhauer can paint a barn in 12 hours. If Farmer Clodhopper helps Boomhauer, it will take 7 hours to paint the barn. How long would it take Farmer Clodhopper to paint the barn by himself?