MTH 121
Review of Exam 1 and Exam 2 Topics, for Exam 3
Spring 2013

1. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$\frac{(2a^{-2}b^4)^3}{(10a^3b)^2}$$

2. Simplify by removing perfect powers from the radicand. Leave the radical sign in your answer.
$\sqrt[4]{\frac{16a^2b^6}{81u^4v^5}}$

3. Put in simplest exponential form: (1) no radicals, and (2) positive exponents only.

$$\sqrt[3]{a}\,\sqrt[4]{a}$$

These formulas may or may not be useful:

$a^3+b^3=(a+b)(a^2-ab+b^2)$ $\qquad$ $a^3-b^3=(a-b)(a^2+ab+b^2)$ $\qquad$ $x=\dfrac{-b\pm\sqrt{b^2-4ac}}{2a}$

4. For the given points, (a) plot the points, (b) find the distance between the points, and (c) find the midpoint of the line segment joining the points.
$(-1,2)$, $(5,4)$

5. Write the standard form of the equation of the circle with the given characteristics.

Endpoints of a diameter: $(0,0)$, $(6,8)$

6. Solve the quadratic equation by factoring: $3+5x-2x^2=0$

7. Use the Quadratic Formula to solve the equation. $12x-9x^2=-3$

8. Solve the inequality and sketch the solution on the real number line.

$$\tfrac{3}{4}x-6\le x-7$$

9. Solve the inequality and sketch the solution on the real number line.

$$|3-4x|\ge 9$$

10. Drane and Route Plumbing Co. charges \$42 per hour, plus \$35 for the service call. Let x be the number of hours they work.

(a) Write the definition of x. Then write an expression for the number of dollars you must pay if they work for x hours.

(b) How much would you pay for $4\frac{1}{2}$ hours?

(c) How long did they work if the bill is \$56?

11. Calvin Butterball and Phoebe Small live in houses that are 1000 yards apart. Calvin starts from home on his bicycle at 3.4 yards per second and rides toward Phoebe's. At the same time, Phoebe starts from her house at 4.1 yards per second and rides toward Calvin's.

(a) How far is Calvin from his house after x seconds?

(b) How far is Phoebe from *Calvin's* house after x seconds?

(c) After 3 minutes, who is closer to Calvin's house?

(d) When are they the same distance from Calvin's house?

12. Solve (and check your answer): $3 = 2 + \dfrac{2}{z+2}$

13. Solve the quadratic equation by completing the square: $2x^2 + 5x - 8 = 0$

14. Combine into a single fraction and simplify.

$$\frac{x^2 - 36}{x} \div \frac{x^3 - 6x^2}{x^2 + x}$$

15. Combine into a single fraction and simplify.

$$\frac{1}{x^2 - x - 2} - \frac{x}{x^2 - 5x + 6}$$