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Exam I
June 01, 2009

To receive full credit all your answers should be carefully justified. Each solution must be the student's own work.

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1. Assume that $u > 0$ and $v > 0$. Simplify

$$\left(\frac{16u^{-4}v^2}{9u^{-2}v^{-4}}\right)^{-\frac{3}{2}}$$

2. Expand and simplify $(x^2 - 2y)^3$.

3. Factor $ab^4 + a^4b$.

4. Rationalize the denominator and simplify the following expression.

$$\frac{1}{2-\sqrt{3}}$$

5. Solve the following equation for x.

$$\left|3 - \frac{x}{2}\right| = 4$$

6. Solve the following equation for x.

$$\frac{1}{5x} = \frac{1}{x-3}$$

7. Solve the following equation for q.

$$p^2 - q^2 = \left(\frac{q}{2}\right)^2$$

8. Solve the following equation for a.

$$4a^2 - 4a - 6 = 0$$

9. Solve the following equation for x.

$$\sqrt{2x+26} - 1 = x$$

10. Find the domain of $\sqrt{2-5(x+2)}$.

11. Solve $|4x - 5| < 6$.

12. Solve the following inequality.

$$\frac{5x}{2x - 1} - 2 \geq 0$$

13. One dimension of a rectangle is 3 times the other dimension. Also, the area of the rectangle is 18 sq. ft. Find the dimensions of the rectangle.

14. 5 less than 3 times a number is 2 times the reciprocal of a number. Find the number.