

The following 20 problems cover the material that will appear on Exam 1 (§P.2-1.2). Answer all problems without a calculator. Simplify all fractions and radical expressions that appear in your answers.

We will take Exam 1 during the second half of class on **Thursday, 7/13**.

1. Express the inequality  $x \geq -3$  in interval notation.

2. Evaluate the expression numerically.

$$\frac{\frac{2}{5} + \frac{1}{2}}{\frac{1}{10} + \frac{3}{15}}$$

3. Simplify the expression and eliminate any negative exponents.

$$\left( \frac{2x^3y^{-4}}{3y^{-1}z^{-5}} \right)^{-2}$$

4. Evaluate the expression numerically.

$$\left( \sqrt[4]{6} \right)^{-8} + \frac{\sqrt{75}}{\sqrt{3}}$$

5. Simplify the expression.

$$x^{5/2} \left( \sqrt{x} - \frac{1}{\sqrt{x}} \right)$$

6. Simplify the expression.

$$\left( w - \frac{1}{w} \right)^{-2}$$

7. Perform the indicated operations and simplify.

$$2(x-1)(3x+3) - 3x(2x-1)$$

8. Perform the indicated operations and simplify.

$$\left( t - \frac{3}{t} \right)^2$$

9. Factor completely.

$$3(t+6)^2 + 6t(t+6)$$

10. Factor the expression completely.

$$x^4 + 5x^3 - 24x^2$$

11. Factor the expression completely.

$$16x^2 - 25$$

12. Perform the indicated operation and simplify.

$$\frac{10x-2}{x+2} - 2$$

13. Perform the indicated operation and simplify.

$$\frac{x^2 + 4x + 4}{x^2 - 2x + 1} \cdot \frac{x^2 - 6x + 5}{x^2 - 3x - 10}$$

14. Solve the equation.

$$\frac{18x - 5}{9x + 3} = 2 - \frac{3}{x}$$

15. Solve the equation.

$$\frac{x^2 - 1}{x + 2} = \frac{x^2 + x - 4}{x + 3}$$

16. Solve the equation.

$$\frac{4}{5}w + \frac{1}{4}(w - 5) = \frac{w + 1}{2}$$

17. Find the distance between the points  $(-3, 3)$  and  $(1, -5)$ .

18. Find the midpoint of the line segment connecting  $(2, 1)$  and  $(9, -3)$ .

19. Determine which of the given points are on the graph of the equation.

$$\sqrt{y} = (x - 5)^2; \quad (8, 3), (0, 25), (4, 1), (2, 81)$$

20. Give an equation of the circle with center  $(3, -4)$  that passes through the origin.