

## MAT 0020 Basic Algebra II

### KEY CONCEPT REVIEW

#### SECTIONS 5.1, 5.2, AND 5.6

**TO RECEIVE CREDIT, DO ALL PROBLEMS, MAKE CORRECTIONS, AND SHOW ALL WORK.**

- 1) Evaluate the expression for the given values of the variable. If an operation is not possible, state why.

$$\frac{2x - 3}{x^2 + 2x - 3}$$

a)  $x = 0$                                       b)  $x = 1$

- 2) Does any other value of the variable make the expression in question 1 undefined? If so, how do you find this value?
- 3) Find any values of the variable that make the given expression undefined.

$$\frac{x + 8}{x^2 + 13x - 30}$$

- 4) How do you simplify a rational expression?
- 5) Explain the mistake in the following.

$$\frac{y^2 - 4}{y - 2} = \frac{\cancel{y^2} - \cancel{4}}{\cancel{y} - \cancel{2}} = y + 2$$

- 6) Can either expression be simplified? If not, explain why.

a)  $\frac{m + 3}{m^2 + 9}$                                       b)  $\frac{3 - m}{m^2 - 9}$

- 7) What was multiplied by  $(a - 5)$  to give the result shown?

$$\frac{(a - 5)(\quad)}{a^3 + 5a^2} = \frac{a - 5}{a^2}$$

**Simplify each expression.**

8)  $\frac{x^2 - 36}{6 - x}$

9)  $\frac{x^2 - 2x - 15}{x + 3}$

10)  $\frac{4x + 4}{12x^2 + 20x + 8}$

11)  $\frac{y^2 - 5y - 14}{y^2 + 11y + 18}$

- A) Prime                                      B)  $\frac{-5y - 14}{11y + 18}$   
 C)  $\frac{y - 7}{y + 9}$                                       D)  $\frac{-5y - 7}{11y + 9}$

- 12) Why is the product shown is not the correct solution?

$$\frac{2x^2 + x}{4} \cdot \frac{28}{2x + 1} = \frac{56x^2 + 28x}{8x + 4}$$

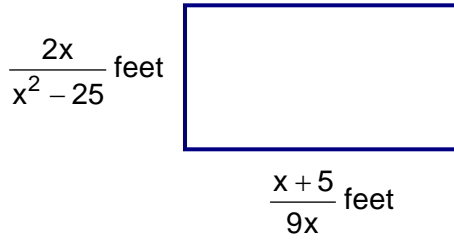
**Multiply and simplify.**

13)  $\frac{(p - q)^2}{p + q} \cdot \frac{p}{p^2 - pq}$

14)  $\frac{y^2 - 6y + 8}{4y + 16} \cdot \frac{y + 4}{4y - 8}$

15)  $\frac{x^2 - 9x + 20}{x^2 - 25} \cdot \frac{x^2 + 8x + 15}{x^2 - x - 12}$

16) Find the area of the rectangle.



Divide and simplify.

17)  $\frac{x^2 - 6x + 9}{7x - 21} \div \frac{11x - 33}{77}$

18)  $\frac{x^2 - 9}{x} \div \frac{9x + 27}{x - 3}$

19)  $\frac{x^2 + 7x + 10}{x^2 + 9x + 14} \div \frac{x^2 + 5x}{x^2 + 3x - 28}$

20) Perform the indicated operations:

$$\left( \frac{x^2 - 9}{x^2 - 1} \cdot \frac{x^2 + 2x + 1}{2x^2 + 9x + 9} \right) \div \frac{2x + 3}{x - 1}$$

Solve each proportion.

21)  $\frac{7}{8} = \frac{x}{24}$

22)  $\frac{y + 8}{y} = \frac{5}{6}$

23)  $\frac{1}{w + 8} = \frac{3}{5w}$

24)  $\frac{3(y + 4)}{4} = y - 6$

25) Choose the correct proportion that solves this problem.

The ratio of a quarterback's completed passes to attempted passes is 5 to 7. If he attempted 21 passes, find how many passes he completed.

A)  $\frac{5}{7} = \frac{21}{x}$

B)  $\frac{5}{7} = \frac{x}{21}$

C)  $\frac{7}{5} = \frac{x}{21}$

D)  $\frac{5}{x} = \frac{7}{21}$

Solve the problem.

26) A recent advertisement claimed that 2 out of every 5 doctors recommend a certain supplement to increase energy levels. If a local hospital employs 200 doctors, how many doctors would you expect to recommend the supplement?

27) An architect recommends that there be at least 17 square feet of work space for every person in an office. If an office measures 11 feet by 13 feet, what is the maximum number of people the office can accommodate?