

## Review for Diagnostic Exam

The following set of problems underline the skills needed for the Diagnostic Exam.

Focus on understanding and mastering the skills and concepts that are involved in these problems.

Simplify:

$$(1) -5[3 - 5(7 - 9)] + 1 =$$

$$(2) 10 - 3(9 - 13) \div 4 =$$

$$(3) 2x - 3 + 5(2x - 6y) + 8 =$$

$$(4) \frac{4x^2 - 25}{(2x^2 + 11x + 15)(2x - 5)} =$$

$$(5) \frac{x + \frac{4}{x}}{\frac{5x}{4x - 7}} =$$

$$(6) \frac{x^2 + 5x + 6}{x} - \frac{3x}{x + 3} =$$

$$(7) \frac{x}{y} + \frac{y}{x} =$$

$$(8) (x^{-1} + y^{-1})^{-2} =$$

$$(9) (3x + 5y)^2 =$$

$$(10) (2x - 5y)(2x + 5y) =$$

$$(11) (2x + 3)(4x^2 - 6x + 9) =$$

$$(12) \frac{5x^2y^{-2}}{15xz^26y^2} =$$

$$(13) \frac{7}{\sqrt{8(x + 4)}} =$$

$$(14) \sqrt{\frac{25x^5y^4}{16x^3y^2}} =$$

$$(15) 17x^2 - 3x(x + 5) + 12 - (8x^2 + 12x + 20) =$$

For problems (16) - (19) factor the given expression:

$$(16) x^2 - y^2 =$$

$$(17) 27 - b^3 =$$

$$(18) 4a^2 - 12ab + 9b^2 =$$

$$(19) 2x^2 + 11x + 15 =$$

$$(20) \text{ If } x = 4 \text{ and } y = -5, \text{ then find } \frac{2xy + x^2}{y - 3x + 1} =$$

$$(21) \text{ If } f(x) = \frac{2x^2 - 5x}{x^2 + 3}, \text{ find } f(-3) =$$

For problems (22) - (25) solve the given equation:

(22)  $2x + 5 = 7 - 2x(2 - 5)$

(23)  $\frac{1}{x} - 5 = \frac{x + 3}{x}$

(24)  $3x^2 + 13x - 10 = 0$

(25)  $x^2 + 7x = -12$

(26) Solve  $3x + 15 < 21$  and indicate your answer on the numberline.

(27) Solve  $5x - 18 \geq 10x$  and indicate your answer with interval notation.

(28) Solve the following system:

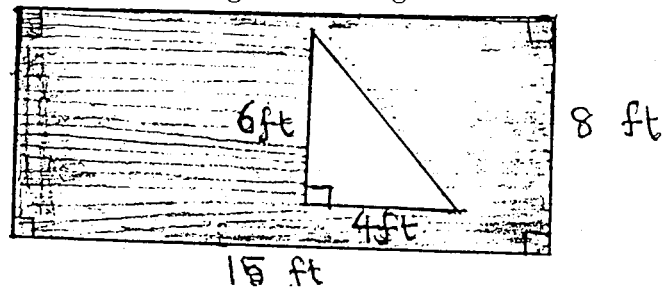
$7x + 3y - 13 = 0$

$-5x + 4y = 3$

(29) Find an equation of the line that passes through the points  $(2, -4)$  and  $(5, 3)$ .

(30) Find the slope and  $y$ -intercept of the line  $-3x + 4y - 12 = 0$ .

(31) Find the area of the shaded region in the figure below.



(32) Ms. Jeadar has only \$5 , \$2 bills in her purse. Her purse contains a total of 37 bills worth \$155. How many \$2 bills are in her purse?

(33) In a ranch there are 4 cows for every 11 cattles. If this ranch contains 252 cows, how many cattle are there in this ranch?

(34) Jilly asked Jason, " How old are you ? ". Jason replied " My grandpa is 77 years old, 8 times my age plus 5 equals my grandpa's age". How old is Jason?