

# Exam 2

## Study Guide

Name \_\_\_\_\_

Answer the questions in the spaces provided. If you run out of room for an answer, continue on the back of the page.

1. Solve the following systems of linear equation:

(a) Solve using the addition method-

$$\begin{cases} 3x + 5y = 7 \\ 3x - 5y = -3 \end{cases}$$

$$\begin{cases} 5x + 7y = 4 \\ -6y = -6 - 5x \end{cases}$$

(b) Solve using any method-

$$\begin{cases} 3x - 24 = 2y \\ -y - 2 = -2x \end{cases}$$

$$\begin{cases} 3x + 5y + z = -4 \\ 2x + 3y + 1z = -5 \\ x + 0y + 3z = 11 \end{cases}$$

2. Factor and simplify the following expressions:

(a)  $x(49x^2 - 121)$

$(27x^2 - 90x + 75)$

(b)  $-5tx^2 + 20t + x^3 - 4x$

$5tx^2 - 20tx + 20t - 3x^2 + 12x - 12$

(c)  $(9x^2 + 30x + 25)$

$(-5x + 25)(5x^2 - 125)$

3. Solve the following equations using the zero product rule:

(a)  $3x^2 + 48x + 8 = 0$

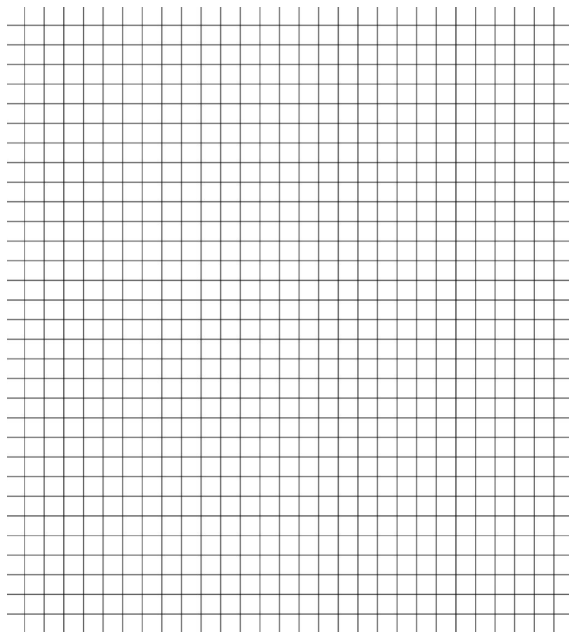
$(6x + 10)^2(2x - 3) = 0$

(b)  $2x^2 - 5x = 12$

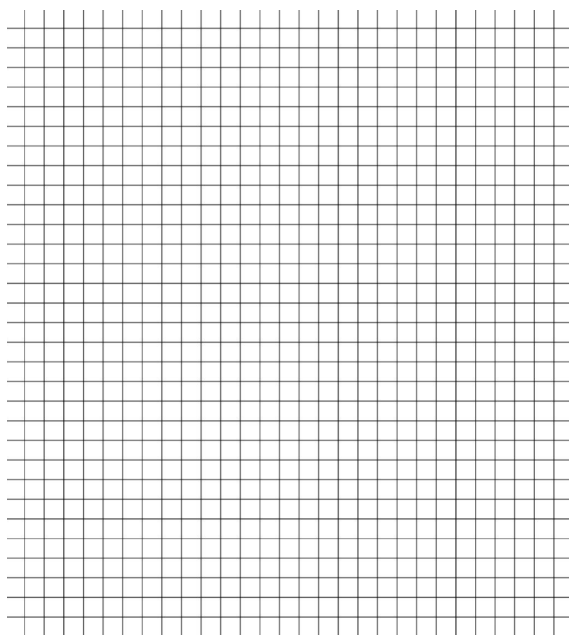
$9x(4x + 2) - 10x = 8x + 25$

4. Graph the following inequalities:

(a)  $3x + 6y > 27 + 21x$



(b)  $9x + 6y > 24x + 36x^2$



5. Solve the following word problems:

- (a) Serena invested money in two mutual funds. One had a return of 4.5% and the other had a return of 7%. Twice as much was invested at 7% as at 4.5%. If the amount earned on the original principal at the end of 1 yr was \$1017.50, determine the amount invested in each fund.

- (b) A 1200-seat theater sells two types of tickets for a concert. Premium seats sell for \$30 each and regular seats sell for \$20 each. At one event \$30,180 was collected in ticket sales with 10 seats left unsold. How many of each type of ticket was sold?

6. Multiply the following polynomials:

(a)  $x(4x - 3)(4x - 3)$

$(3x^2 - 10x)(9x + 2)$

(b)  $-(xy + x)(y^2 - y)$

$5(5x + 1)(5x - y)$

(c)  $\frac{1}{9}(3x - 9)(3x + 9)$

$(-5x)(x - 25) + 125$

(d)  $(x^3 + y^3)(x^3 - y^3)$

$(x^3 + y^3)^2$