

SHOW ALL WORK FOR ALL PROBLEMS. Leave fractional answers in improper form if appropriate. Give irrational answers in EXACT radical form (simplified). No decimal answers!

Use a separate sheet of paper and write neatly as this assignment will be collected by your teacher.

I. Solve the following equations, inequalities, and systems. If a problem has no solution, write NO SOLUTION. Write solutions to systems in  $(x,y)$  form. Check your work!

[1]  $4y - 1 = 31$

[2]  $7n - 6 = 9n - 114$

[3]  $5a - 1 - 3(a+7) = 2(a - 6)$

[4]  $\frac{3}{x^2-7x+6} = \frac{1}{x-1}$

[5]  $2x + \frac{2}{3}(4 - x) = \frac{1}{6}(4x + 5)$

[6]  $\sqrt{3x - 2} = 4$

[7]  $\begin{cases} 4x - y = 7 \\ x - 5y = -3 \end{cases}$

[8]  $\frac{3}{x+3} + \frac{2}{x+3} = 4$

[9]  $\frac{7x+2}{4} = \frac{5}{x-3}$

[10]  $4x^2 - 7x - 2 = 0$

[11]  $|-3 - 2a| < 11$

[12]  $x^2 + 6x - 2 = 0$

[13]  $\frac{4x-5}{x+2} = \frac{1-5x}{x+6}$

[14]  $m^3 + 4m^2 - 9m - 36 = 0$

[15]  $|2x + 1| < 7$

[16]  $\frac{cx-a}{2c} = d$  (Solve for  $x$ .)

[17]  $2\sqrt{t} = 6$

[18]  $\frac{x}{3} - \frac{3}{x} = 3$

II. Perform the following arithmetic operations. NO CALCULATORS! Show work. Check your arithmetic. No decimal answers. Simplify all fractions and radicals.

[19]  $3 + 9 \cdot 7 - 8 \div 2$

[20]  $\frac{15 \times 4 + 9}{(2+1)(2-1)}$

[21]  $\frac{15 \times (4+9)}{(2+1)2 \times 1}$

[22]  $2 \times 9 \times 50 \times 11$

[23]  $(-7+2) + 5$

[24]  $\frac{-5}{4} + 2 + \frac{1}{4} + (-8)$

[25]  $(-9)(-8) - 9(-8)$

[26]  $\frac{-30}{\frac{-1}{2}}$

[27]  $\frac{2}{3} + \frac{3}{10}$

[28]  $\frac{5}{7} \times \frac{14}{16}$

[29]  $\frac{1}{2} \div \frac{3}{8}$

[30]  $\frac{3}{8} - \frac{1}{4}$

$$[31] \frac{7}{20} \times \frac{16}{21}$$

$$[32] \frac{5}{12} - \frac{1}{15}$$

$$[33] \frac{4}{7} + \frac{2}{3}$$

$$[34] \frac{4}{7} \div \frac{3}{14}$$

**III. Multiply the following polynomials and simplify answers.**

$$[35] 3x(2 - 5x)$$

$$[36] 2x(4x - 9)$$

$$[37] (5x + 1)(2x)$$

$$[38] (3x + 4)(5x - 3)$$

$$[39] 15x(x^3 - 2x^2 + 4x - 1)$$

$$[40] 2x[3 - 2(3+x)] - x^2$$

$$[41] (5k + 3)(5k - 3)$$

$$[42] (2x + 7)(2x + 7)$$

$$[43] (8x - 2)^2$$

$$[44] (n - 5)(n + 7)$$

$$[45] x^3 (2x - 4y + 9z)$$

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SHOW ALL WORK FOR ALL PROBLEMS. Leave fractional answers in improper form if appropriate. Give exact answers for radicals (no decimals.) Use a separate sheet of paper and write neatly as this assignment will be collected by your teacher.

I. Solve the following equations, inequalities, or systems. If a problem has no solution, write NO SOLUTION. Answers to systems should be written in  $(x, y)$  form. Simplify fractions and radicals.

[1]  $.5y + .1 = y^2$       [2]  $\begin{cases} y = 6 - 3x \\ 5x - 4y = 10 \end{cases}$       [3]  $3 - \frac{3}{3x} = x$       [4]  $\sqrt{\frac{5a+4}{2}} = 4$

[5]  $3 + 5(x - 7) > 3x + 7$       [6]  $\frac{3}{a+5} - \frac{2}{2a+3} = 0$       [7]  $7 - 2x^2 = 0$       [8]  $2\sqrt{x-3} = 5$

[9]  $\sqrt{3x^2 + 4x} = 8$       [10]  $-2 < y+4 < 5$       [11]  $-5 < 3x+1 < 4$       [12]  $3x - 1 > 8$  or  $2 - x > 0$

II. Solve the following word problems. Be sure to clearly answer questions and provide units if applicable (in other words: feet, miles, dollars, inches...). You must show the algebraic equation/inequality being used in the problems—these are NOT guess and check. The algebra is what is being reviewed.

[13] An elevator left the twenty-sixth floor of a building and went up eight floors, then down twelve, and back up four. On what floor was the elevator at that point?

[14] If three times a number is increased by 11, the result is 68. Find the number.

[15] If you subtract 34 from the product of 15 and a number you get 146. Find the number.

[16] The sum of two numbers is 20. Twice one number is 4 more than four times the other. Find the numbers.

[17] A candidate goes door to door along Main Street from a point 16 blocks west of campaign headquarters to a point 12 blocks east of headquarters. How many blocks has she walked?

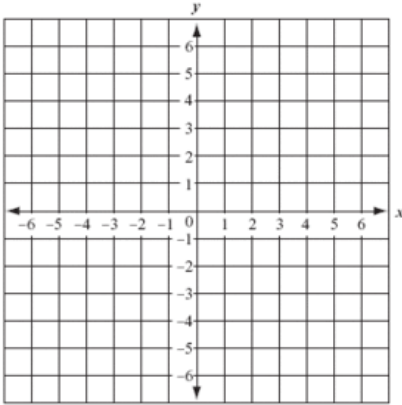
[18] A collection of quarters and dimes is worth \$6.75. The numbers of dimes is 4 less than three times the number of quarters. How many dimes and how many quarters are there?

[19] Three-fifths of a number added to one-fourth of the number is 51. Find the number.

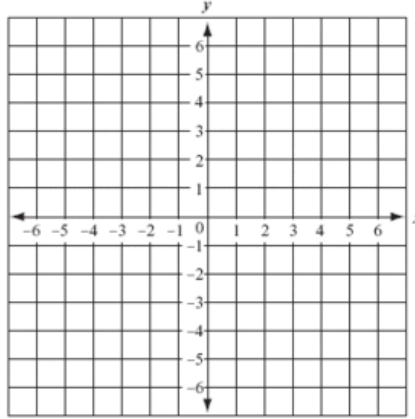
[20] The bottom of a 7m ramp is 5m from the base of a loading platform. Find the height of the platform.

III. Graph the following linear equations/systems of inequalities:

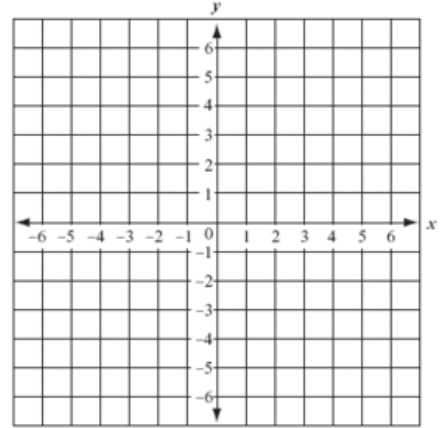
[21]  $y = 4x + 3$



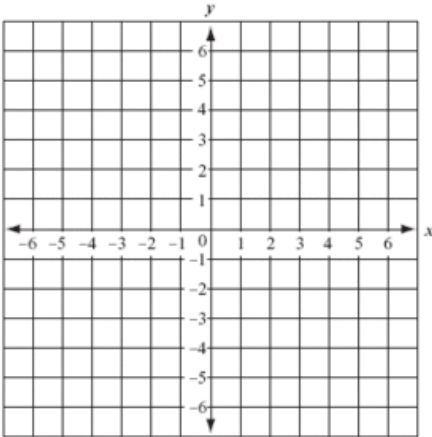
[22]  $y = 6 - 2x$



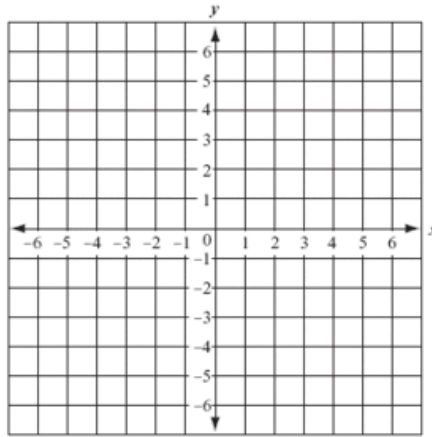
[23]  $y = 2x - 5$



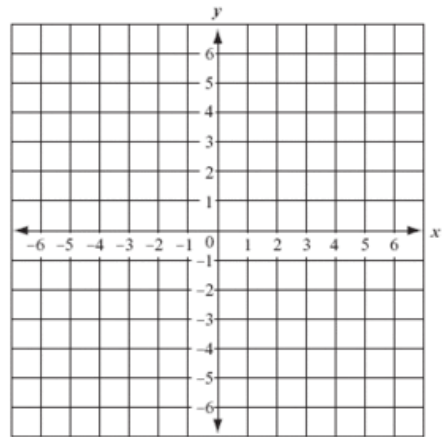
[24]  $\begin{cases} y > 2x - 3 \\ y \leq -x + 1 \end{cases}$



[25]  $\begin{cases} y = 7x - 2 \\ y < x + 5 \end{cases}$



[26]  $\begin{cases} x > 2 \\ y \leq 5 \end{cases}$



[33]

IV. Simplify the following expressions. Watch signs and powers. Collect like terms.

[27]  $n^4 \cdot n^5 \cdot n$

[28]  $(3t^2)(12t^5)$

[29]  $(4xy)(2xy^3)(-2y^2)$

[30]  $(2x^2)^4 + 3y^8$

[31]  $\frac{2rs^2}{3t} \cdot \frac{9t^2}{4rs}$

[32]  $\left(\frac{3z}{y}\right)^3 \cdot \frac{2yz}{15}$

[33]  $\frac{c+2}{c^2} \cdot \frac{3c}{c^2-4}$

[34]  $\frac{t^2-2t-8}{t^2-4} \cdot \frac{t^2-5t+6}{t^2-t-12}$