

No notes or calculators are allowed when taking this test. Be sure to follow the directions for each part of the test. You may do scratch work anywhere on the pages of this test. The yellow paper is also attached for that purpose. Turn in all you work, including any scratch work.

Part I. (2 points each) Write your answers on the appropriate lines in the answer column.

1. Simplify: $(-2)^3 + 5(8 \div 2) + 2$ 1. 14
 $-8 + 5(4) + 2$ $8 - 22$

2. Solve: $\frac{11x}{5} = 2x - 16$ $11x = 10x - 80$ 2. -80
 $x = -80$

3. Solve: $\frac{2}{3} = \frac{16}{3x}$ $6x = 48$ 3. 8
 $x = 8$

4. Solve: $\frac{3}{2x-5} = \frac{1}{5}$ $15 = 2x - 5$ 4. 10
 $20 = 2x$

5. What is the slope of the line with equation $2x + y = 12$ 5. -2
 $y = -2x + 12$

6. What is the y-intercept of the line with equation $2x + y = 12$ 6. 12

7. What is an equation for the line with y-intercept 5 that is perpendicular to the line $y = 4x + 3$? 7. $y = -\frac{1}{4}x + 5$

8. Determine the slope of the line passing through (3, 12) and (5, 24). 8. 6

9. Solve for P: $Q = \frac{3P-4}{5}$ $5Q = 3P - 4$ 9. $\frac{5Q+4}{3}$
 $3P = 5Q + 4$
 $P = \frac{5Q+4}{3}$

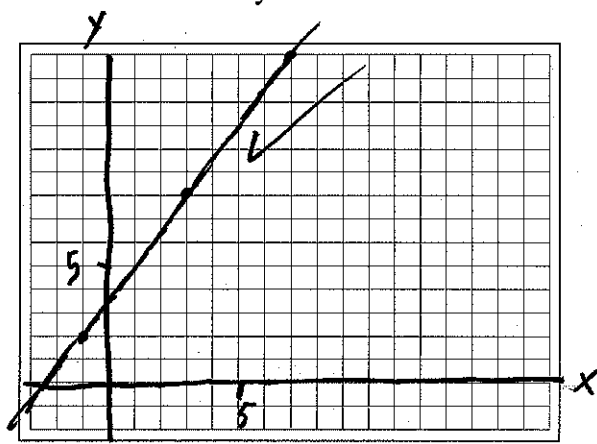
10. Remove parentheses and simplify: $3[11x - 3(4x - 1)]$ 10. $-3x + 9$
 $3(11x - 12x + 3) = -3x + 9$

Part II (5 points each). Show your work in the spaces provided. Identify any variables you introduce and express your conclusions using appropriate sentences.

11. Consider the data in the table below. Graph the data points and show how to determine an equation for the line that contains those data points. Draw and label your axes.

x	y
-1	2
3	8
7	14

$\text{slope} = \frac{3}{2}$ ✓
 $y = \frac{3}{2}x + \frac{7}{2}$ ✓
 $8 - \frac{9}{2} = \frac{7}{2}$ ✓
 $y = \frac{3}{2}x + \frac{7}{2}$ ✓



12.-13. Show how to solve the following word problems using the steps recommended in the text. (Introduce and define variables. Set up an equation. Solve the equation if required. State your conclusions using complete English sentences.)

12. The rent on a magazine kiosk is \$225 per month. Suppose the selling price of each magazine is \$2.50, and the wholesale price of a magazine when purchased by the retailer is \$1.00.

a. Write an equation expressing the retailer's profit as a function of the number of magazines sold. (Assume she sells all the magazines she purchases and her only overhead consists of rent and the cost of magazines.)

let $m =$ the number of magazines sold ✓
 $P =$ the profit (\$) in the month ✓
 $P = 1.50x - 225$ ✓

b. If the kiosk owner needs to make a profit of \$1,200 per month, how many magazines must she sell each month?

$1200 = 1.50x - 225$ ✓
 $1425 = 1.5x$
 $950 = x$
 She must sell 950 magazines each month ✓

c. How many magazines must she sell to just break even?

$1.50x - 225 = 0$
 $1.5x = 225$
 $x = 150$
 She must sell 150 magazines to break even ✓

13. A chart in *USA Today* showed how the amount of money each American spends annually on prescription drugs, above the amount covered by insurance, was predicted to be increasing from year to year. The chart gave specific numbers for 2000 (\$143) and 2010 (\$351), but the trend appeared to be linear.

- a. Write a linear equation for the predicted relationship between expenditure on drugs and time measured in the number of years since 2000.

t = the number of years since 2000
 A = the amount in billions of dollars spent on drugs annually

t	A
0	143
10	351

} 208

$$\frac{\Delta A}{\Delta t} = \frac{208}{10} = 20.8$$

$$A = 20.8t + 143$$

- b. What does your linear equation predict to be the average monthly expenditure on drugs in 2008?

let $t = 8$

$$20.8(8) + 143 = 166.4 + 143 = 309.4$$

$$\frac{309.4}{12} \approx 25.78$$

$$\begin{array}{r} 25.78 \\ 12 \overline{) 309.4} \\ \underline{24} \\ 69 \\ \underline{60} \\ 94 \\ \underline{84} \\ 100 \\ \underline{96} \\ 4 \end{array}$$

So, about \$25.78 billion is spent monthly on drugs on the average