

# Fayette County Algebra I Placement Exam

Directions: Show all work in the appropriate box and circle your final answer. Follow the directions specific for each question.

1. Simplify:  $[3 - 5(2 - 7)] \div [4^2 + 2(-2 - 4)]$

$$[3 + 5 \cdot 5] \div [16 + -12]$$

$$28 \div 4$$

$$\boxed{7}$$

2. Solve for x:  $2x + 3(2x - 2) = -86$

$$2x + 6x - 6 = -86$$

$$8x - 6 = -86$$

$$+6 \quad +6$$

$$8x = -80$$

$$\boxed{x = -10}$$

3. Solve for x:  $-8x + 4(x - 1) = 4x - 3(2x - 4)$

$$-8x + 4x - 4 = 4x - 6x + 12$$

$$-4x - 4 = -2x + 12$$

$$-16 = 2x$$

$$\boxed{x = -8}$$

4. Solve using an equation. You must show the equation and precisely how you solved it.

Five times a number, increased by 3, is the same as three times a number increased by 27.

Find the #.

$$5x + 3 = 3x + 27$$

$$2x + 3 = 27$$

$$2x = 24$$

$$\boxed{x = 12}$$

5. Solve using an equation. You must show the equation and precisely how you solved it.

Theo has \$5 more than Denise and Denise has \$11 more than Ruby. Together they have \$45. How much money does each have?

$$\text{Ruby} = R$$

$$\text{Denise} = R + 11$$

$$\text{Theo} = R + 11 + 5 = R + 16$$

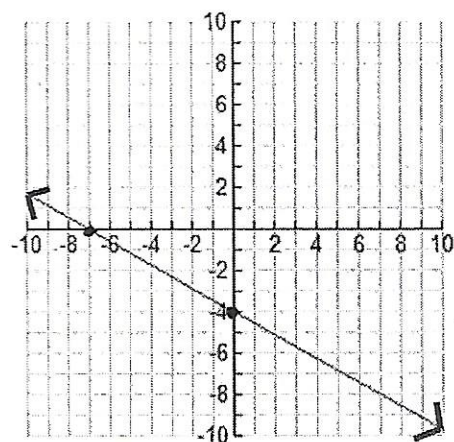
$$3R + 27 = 45$$

$$3R = 18$$

$$R = 6$$

Ruby \$6  
Denise \$17  
Theo \$22

6. Find the equation of the line shown below:



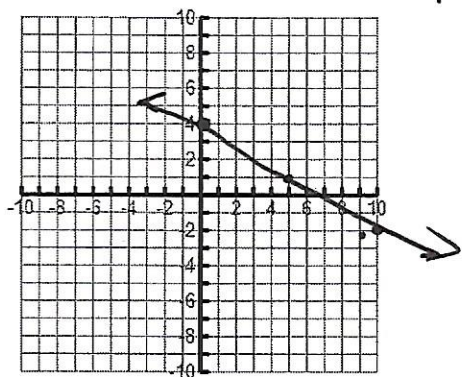
$$\boxed{y = -\frac{4}{7}x - 4}$$

or  $\boxed{y = -\frac{1}{2}x - 4}$  <sup>accept.</sup>

7. Graph the line on the axes:  $-3x - 5y = -20$

$$-5y = 3x - 20$$

$$y = -\frac{3}{5}x + 4$$



8. Find the slope of the line passing through the points  $(8, -3)$  and  $(-2, -7)$ .

$$m = \frac{-7 - (-3)}{-2 - 8}$$

$$= \frac{-7 + 3}{-10}$$

$$= \frac{-4}{-10} = \boxed{\frac{2}{5}}$$

9. Find the equation of the line with a slope of  $-\frac{4}{5}$  that passes through the point  $(-10, -3)$ . Write your answer in slope-intercept form.

$$y - (-3) = -\frac{4}{5}(x - (-10))$$

$$y + 3 = -\frac{4}{5}(x + 10)$$

$$y + 3 = -\frac{4}{5}x - 8$$

$$\boxed{y = -\frac{4}{5}x - 11}$$

$$\text{or } -3 = -\frac{4}{5}(-10) + b$$

$$-3 = 8 + b$$

$$-11 = b$$

$$y = -\frac{4}{5}x + b$$

$$\boxed{y = -\frac{4}{5}x - 11}$$

10. Solve the system of equations using any algebraic method. Write your solution as an ordered pair. You must show all your work. Do not use guess and check.

$$\begin{cases} -2x + 9y = -1 & 3(-2x + 9y = -1) \\ -3x + 6y = -9 & -2(-3x + 6y = -9) \end{cases}$$

$$\cancel{-6x} + 27y = -3$$

$$\cancel{6x} - 12y = 18$$

$$15y = 15$$

$$\boxed{y = 1}$$

$$(5, 1)$$

$$-2x + 9(1) = -1$$

$$-2x = -10$$

$$\boxed{x = 5}$$

11. Solve using a system of equations. You must show all your work. Do not use guess and check.

Your school held a bake sale and 75 pies were sold. Pecan pies were \$14.00 and chocolate pies were \$10.50. Your school collected \$903 from the sale of these pies. How many pecan pies AND how many chocolate pies were sold?

$$p + c = 75$$

$$14p + 10.5c = 903$$

$$-14p - 14c = -1050$$

$$\underline{14p + 10.5c = 903}$$

$$-3.5c = -147$$

$$c = 42$$

$$p = 75 - 42 = 33$$

33 pecan

42 chocolate

12. Solve for  $x$  and graph on the number line below:  $-22 < -5x - 7 \leq 18$

$$-15 < -5x \leq 25$$

$$3 > x \geq -5$$



13. Simplify completely. Write the answer with no negative exponents:

$$\frac{54x^8y^2z^4}{36x^3y^5z^4}$$

$$\frac{9 \cdot 6 x^5}{6 \cdot 6 y^3}$$

$$\frac{3x^5}{2y^3}$$

14. Simplify:  $(4x^2 - 8x - 6) - (7x^2 + 6x - 5)$

$$4x^2 - 8x - 6 - 7x^2 - 6x + 5$$

$$-3x^2 - 14x - 1$$

15. Multiply:  $(2x - 7)(5x + 8)$

$$10x^2 + 16x^2 - 35x - 56$$

$$10x^2 - 19x - 56$$

16. Factor completely:  $49x^2 - 36$

$$(7x + 6)(7x - 6)$$

17. Factor completely:  $x^2 + 15x - 54$

$$(x + 18)(x - 3)$$

9	6
1	54
2	27
3	18
6	9

18. Factor completely:  $12x^2 - 13x - 14$

$$12x^2 - 21x + 8x - 14$$

$$3x(4x - 7) + 2(4x - 7)$$

$$(4x - 7)(3x + 2)$$

168
2 84
3 56
4 42
6 28
8 21

19. Solve for  $x$ :  $5x^2 - 11x - 12 = 0$

$$(5x + 4)(x - 3) = 0$$

$$5x = -4$$

$$x = -\frac{4}{5} \quad x = 3$$

20. Solve for  $x$ :  $x^2 - 17x = 84$

$$x^2 - 17x - 84 = 0$$

$$(x - 21)(x + 4) = 0$$

$$x = 21, x = -4$$

12.7
14
21.4