

MAT-080 Section N Test 5T

Name: _____

Show your work to get full credit.

1. In any right triangle, the sum of the squares on the sides next to the right angle is equal to the square on the hypotenuse. Draw a picture and write an equation that expresses this fact.

2. Solve the equation and check your solution. If the equation has no solution, say why not.

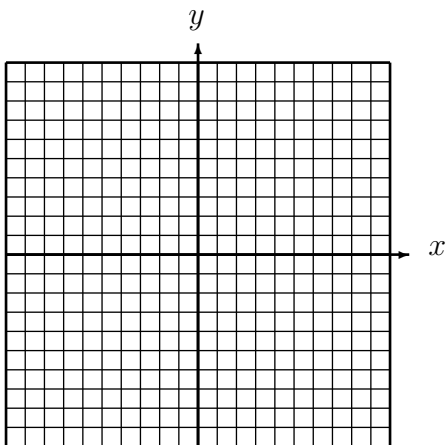
$$6.5(1 + 2x) = 13$$

3. A grocer mixes two kinds of coffee costing \$4.25 per pound and \$5.75 per pound to make 100 pounds of a mixture costing \$5.00 per pound. How many pounds of each kind of coffee does the grocer put into the mixture?

4. What is the slope-intercept form of the linear equation whose solutions include $(1, 4)$ and $(5, 7)$?

5. The points $(-2, -3)$, $(2, -1)$, and $(10, y)$ are all in a line (they are co-linear.) Find y .

6. Graph the equation $y = (7/5)x - 5$, then solve for x when $y = 0$.



7. Write in slope-intercept form the equation of any line parallel to $4y - x = -4$.

8. Perform the division.

$$\frac{4x^3 + 10x^2 - 8x - 6}{2x + 1}$$

9. Solve the equation.

$$\frac{1}{x + 1} + \frac{1}{x - 1} = \frac{2}{x^2 - 1}$$

10. One factor of $x^3 + 2x^2 - 5x - 6$ is $x - 2$. What are the other factors?

11. Determine the average of the three real numbers x , $x/2$, and $x/3$.

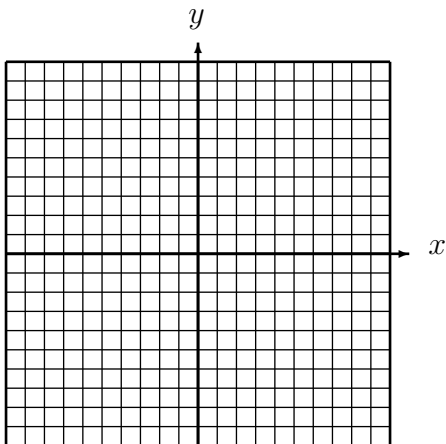
12. Solve the equation by completing the square.

$$2x^2 - 6x + 3 = 0$$

13. Solve the equation by using the quadratic formula.

$$2x^2 + 2x - 4 = 10$$

14. Sketch the parabola $y = -x^2 + 7$. Find the vertex and any x -intercepts. See the textbook, section 8.4.



15. An object is dropped from a height of seventy-five feet. Its height h (in feet) and at any time t is given by $h = -16t^2 + 75$ where t is measured in seconds. Find the time required for the object to fall to a height of thirty-five feet.

16. A cord of wood is eight feet long, four feet high, and four feet wide. Suppose that logs have a volume of one-quarter cubic foot. What is the largest number of logs that could be in the cord of wood? (Assume there are no gaps between logs.)

17. Solve this system of linear equations.

$$\begin{cases} 3y - x = 12 \\ 5y + 2x = 31 \end{cases}$$

18. Name the property of real numbers that justifies this statement:

$$a + b = b + a$$

19. Solve the equation.

$$\sqrt{3t} - 9 = 3$$

20. Write in standard form.

$$\frac{5 - 2i}{4 - i}$$

21. The velocity v (in feet per second) of an object is given by $v = \sqrt{2gh}$, where g equals thirty-two feet per second per second and h is the distance (in feet) the object has fallen. Find the height from which a rock has been dropped when it strikes the ground with a velocity of ninety-six feet per second.