

NAME: _____ Score _____ /100
Please print

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

Circle T or F, whichever is correct. 2 pts. each for 1 – 30. 5 pts. each for all others.

1. T F A solution of the equation $x^5 + 3x^2 + 2x - 8 = 0$ is 1.
2. T F $(3, 8] = \{x | x \in \mathbb{R} \text{ and } 3 < x < 8\}$
3. T F The graph of a quadratic equation in two variables can be a line.
4. T F The product of a complex number and its conjugate is a real number.
5. T F $5x^3 - 3x^2 + 8x + 17$ is a mathematical equation.

Circle the symbol for the set of numbers if the number at the left is in the set of numbers. In each case you will circle more than one set.

The Symbols are standard: **C** is the complex numbers, **R** is the real numbers, **F** is the irrational numbers, **Q** is the rational numbers, **Z** is the integers, **W** is the whole numbers, and **N** is the natural numbers, and **P** is the prime numbers.

6. 3 is in **C R F Q Z W N P**
7. $\frac{2}{5} - 7i$ is in **C R F Q Z W N P**
8. $-\frac{7}{8}$ is in **C R F Q Z W N P**
9. $\sqrt{7}$ is in **C R F Q Z W N P**
10. -43 is in **C R F Q Z W N P**

Fill in each of the blanks to make the statements true.

11. $(3,7]$ is an example of _____ notation.
12. The exact circumference of a circle with radius 5 is _____.
13. A linear equation in one variable is an equation which may be written in the form _____.
14. A quadratic equation in one variable is an equation which may be written in the form _____.
15. A quadratic equation in two variables is an equation which may be written in the form _____.

Circle all the words which could be used to correctly complete the sentence.

16. $2x - 7 = 0$ is a (linear quadratic identity conditional contradiction) equation.

17. $x^4 + 1 = 0$ is a (linear quadratic identity conditional contradiction) equation.

18. $x^2 + 5x + 6 = 0$ is a (linear quadratic identity conditional contradiction) equation.

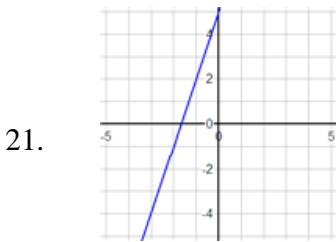
19. $x^2 + 7 > 0$ is a (linear quadratic identity conditional contradiction) inequality.

20. If $2x - 1 < 4$, then $-6x + 3 (<, =, >, \leq, \geq) -12$.

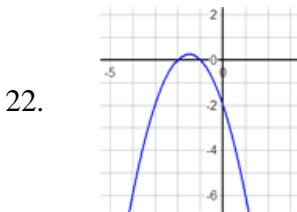
Match the following phrases with the graphs in problems 21 – 25 by writing the letter for the phrase in the blank.

- (a) linear equation in one variable
- (d) quadratic equation in one variable
- (g) linear inequality in one variable
- (k) quadratic inequality in one variable

- (b) linear equation in two variables with positive slope
- (c) linear equation in two variables with negative slope
- (e) quadratic equation in two variables with a > 0
- (f) quadratic equation in two variables with a < 0
- (h) linear inequality in two variables
- (p) quadratic inequality in two variables



Is the graph of _____.



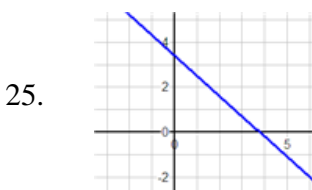
Is the graph of _____.



Is the graph of _____.



Is the graph of _____.



Is the graph of _____.

26. Write the equation of the circle with center at (h, k) and radius r .


27. Write the quadratic formula.

28. Write the multiplicative inverse of the complex number $a + bi$.

29. Write the zero factor property.

30. Write the formula for the slope m of the line segment joining two points (x_1, y_1) and (x_2, y_2)

31. Compute the product $(3 + 2i)(1 - 5i)$. Your answer should be written in standard form.

32. The graph of a “less than” inequality is 

a) Shade/sketch the graph of the boundary equation on this graph



b) Shade/sketch the graph of the “greater than” inequality on this graph

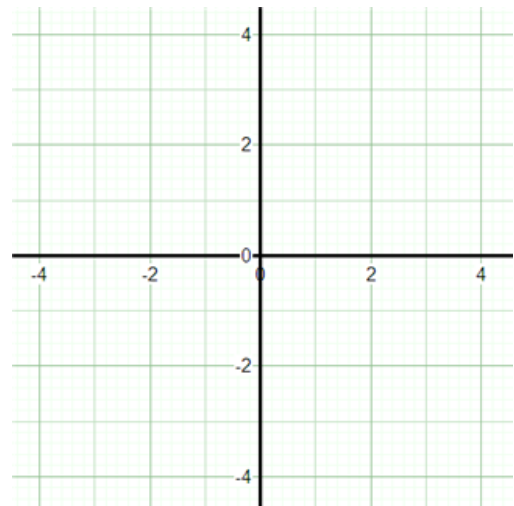


33. Use the Quadratic formula to solve the equation $x^2 + x - 1 = 0$. Show your work. no work: no credit

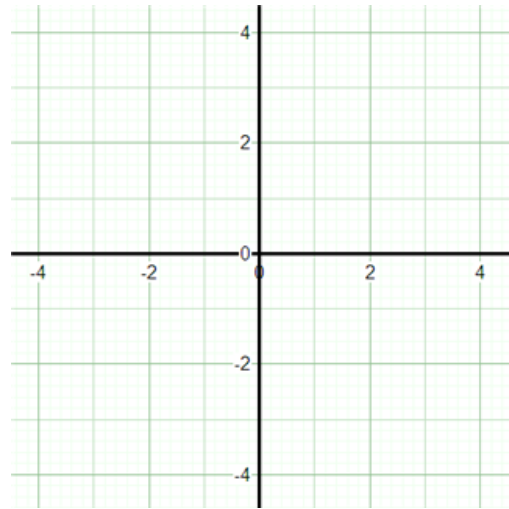
34. A rectangular garden is 25 ft. wide. If its area is 1125 sq. ft., what is its length? Show your work. no work:no credit

35. Find the equation of the line through $(3, -4)$ with slope $\frac{2}{5}$. Show your work. no work:no credit. Write your answer in slope-intercept form.

36. Sketch the graph of $y = 2x - 3$ Show your work. Label all important points. no work:no credit. Your work should show how you determined the important points.



37. Sketch the graph of $y = (x - 3)(x + 1)$ Show your work. Label all important points. no work:no credit
Your work should show how you determined the important points.



38. A grocer mixes cashews that cost \$3.49 per pound and hazelnuts that cost \$4.52 per pound to make 100 pounds of a mixture that costs \$3.89 per pound. How much of each kind of nut is put into the mixture?

Solution:

Let x be the amount of cashews to be put into the mixture.

Then $100 - x$ is the amount of hazelnuts put into the mixture.

The cost of the cashews in the mixture is $3.49x$

The cost of the hazelnuts in the mixture is $4.52(100 - x)$

The total cost contributed by the cashews and hazelnuts is $3.49x + 4.52(100 - x)$.

However, the total cost of the final mixture is required to be $(3.89)(100) = 389$.

This completes the analysis of the problem and we are now in a position to model the mixture problem with an equation.

Write that equation. Do not solve the equation.