Name: _____ Class: _____ Date: _____

Summer Assignment (Advanced Math Lab/ Advanced Algebra and Trigonometry)
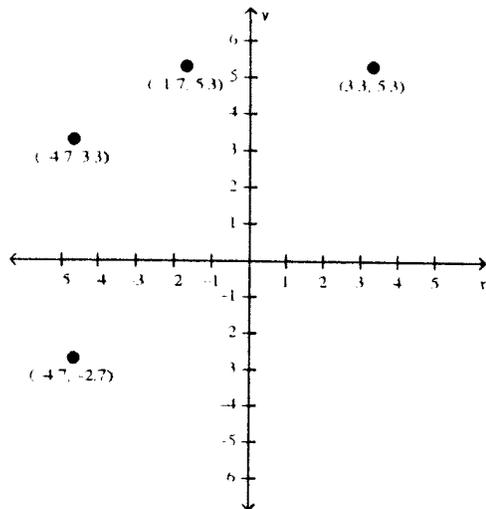
Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. Graph the given relation or equation and find the domain and range. Then determine whether the relation or equation is a function.
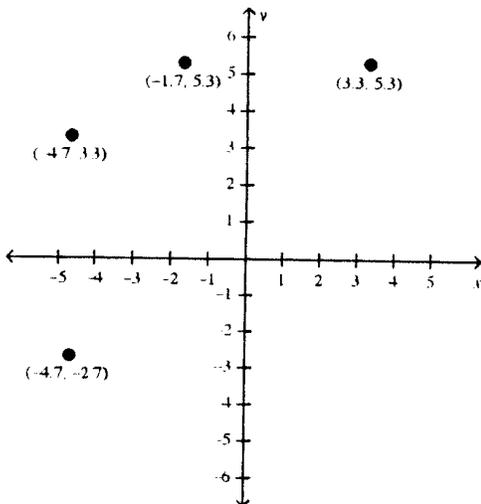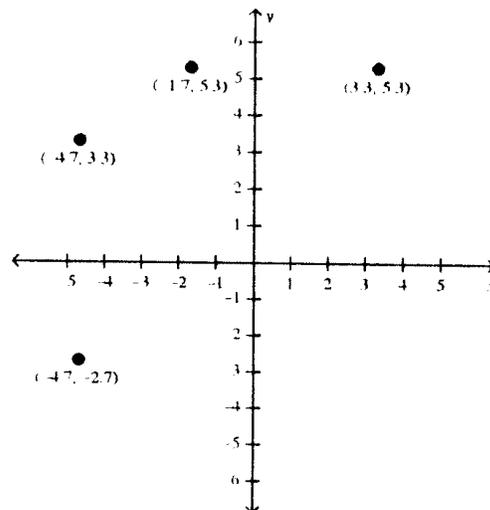$(3.3, 5.3), (-1.7, 5.3), (-4.7, 3.3), (-4.7, -2.7)$

a.

Domain: $\{-4.7, -1.7, 3.3\}$
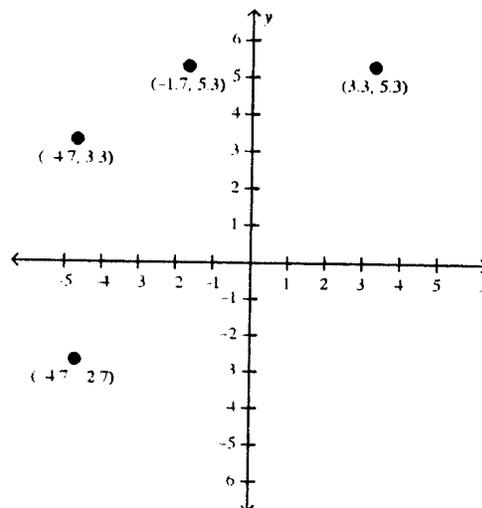Range: $\{-2.7, 3.3, 5.3\}$
The equation is a function.

c.

Domain: $\{-4.7, 5.3, 3.3\}$
Range: $\{-2.7, 3.3, -1.7\}$
The equation is not a function.

b.

Domain: $\{-2.7, 3.3, 5.3\}$
Range: $\{-4.7, -1.7, 3.3\}$
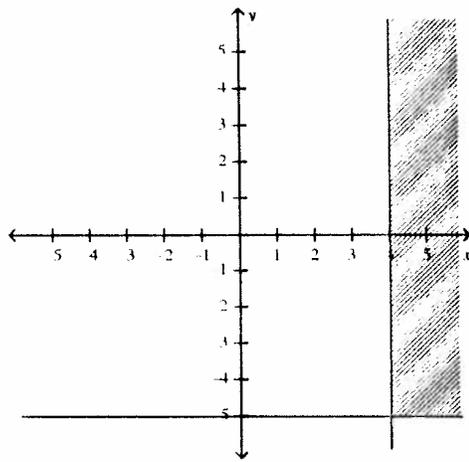The equation is a function.

d.

Domain: $\{-4.7, -1.7, 3.3\}$
Range: $\{-2.7, 3.3, 5.3\}$
The equation is not a function.

1

Given below are some inequalities. Plot the feasible region graphically.
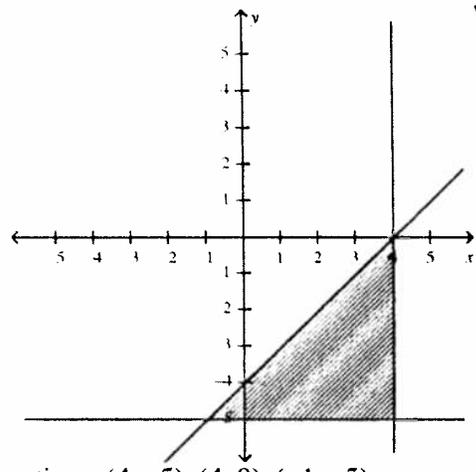
_____ **2.** $y \geq -5$
$x \leq 4$
$y \leq x - 4$
$f(x,y) = x + y$

a.

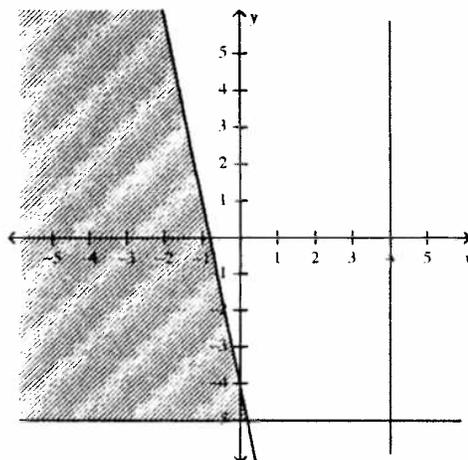
ertices: $(4,-5)$
max: $f(4,-5) = -1$
min: $f(4,-5) = -1$

c.

ertices: $(4,-5),(4,0),(-1,-5)$
max: $f(4,0) = 4$
min: $f(-1,-5) = -6$

b.

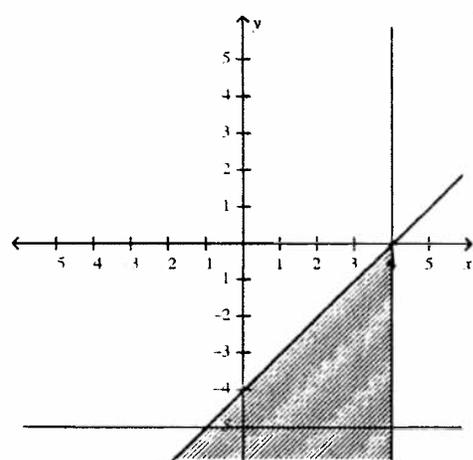

ertices: $(4,-5),(4,0),(-1,-5)$
max: $f(4,0) = 4$
min: $f(-1,-5) = -6$

d.

ertices: $(4,-5),(4,0),(-1,-5)$
max: $f(4,0) = 4$
min: $f(-1,-5) = -6$

2

Short Answer

3. Find the value of $x - y^n$ if $x = 1000, y = 10$, and $n = 4$.

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4. The formula to calculate the volume of a cylinder is $V = \pi r^2 h$. Write an expression to represent the volume of the cylinder.

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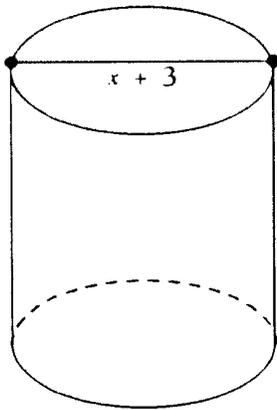
5. Find the value of $a^n b^n$ if $n = 3, a = 100$, and $b = \dfrac{1}{4}$.

Simplify the given expression.

6. $6x + 21y - 26x + 64y$

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7. $\left(-2x^2 - 9x + 17\right) - \left(16x^2 + 17x - 1\right)$

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8. $4a^3(3ab^3 - 9a^2b^2 + 3a^3b)$

9. $\dfrac{3p^4}{5q^5(r-5)^3} \cdot \dfrac{37q^2(r-5)}{30p^3}$

10. $\dfrac{12x}{2y} \cdot \dfrac{3y^2}{24x^3}$

11. $\dfrac{5x^2y^3}{3a^5b^4} \div \dfrac{23x^5y}{42\ a^7b^3}$

12. $\dfrac{5(a^2+5a+6)}{3(a^2-36)} \div \dfrac{41(a+3)}{6(a+6)}$

13. $\dfrac{\dfrac{d}{5f^2}}{\dfrac{d^4}{32f^3}}$

14. $\dfrac{\dfrac{8x^2-8}{x}}{\dfrac{8(x^2+8)}{26x^2-31x}}$

15. Evaluate the given expression if $k = -84$.

$5\,|\,k+10\,|-|\,4k\,|$

Solve the given equation. Check your solution.

16. $60 \mid 2s + 5 \mid = 64$

Solve the given inequality. Describe the solution set using the set-builder or interval notation. Then, graph the solution set on a number line.

17. $25\left(\dfrac{1}{4}m + 3 \right) \le 7$

Solve the given inequality. Graph the solution set on a number line.

18. $\mid p - 1 \mid < 6$

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19. Find the value of $f(-9)$ and $g(4)$ if $f(x) = -4x + 8$ and $g(x) = 6x + 25x^{-2}$.

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20. Find the x-intercept and the y-intercept of the graph of the equation $11x + 12y = 8$. Then graph the equation.

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21. Graph the line that passes through $(-1, 5)$, perpendicular to a line whose slope is $-\dfrac{1}{6}$.

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22. Write an equation in slope-intercept form for the line that satisfies the following condition.
    slope $\dfrac{1}{2}$ and passes through $(4, -17)$

23. Write an equation in slope-intercept form for the line that satisfies the following condition. passes through $(6, 11)$, parallel to the line that passes through $(2, 4)$ and $(23, 23)$

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24. Write an equation in slope-intercept form for the line that satisfies the following condition.

passes through $(29, 8)$, perpendicular to the graph of $y = \frac{1}{13}x + 17$

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25. The data below represents the relationship between the increase in rainfall over a period of twelve months. Use the first and fourth ordered pairs shown below to write a prediction equation. Use the prediction equation to predict the missing value.

Months	2	3	7	9	12
Increase in Rainfall (cm)	1.3	1.8	5.7	8.9	?

Solve each system of equations.

26. $8x + 7y = 18$
$3x - 5y = 22$

Solve the given system of equations.

27. $-3a = 36$
$10a + 3c = 9$
$2b + 5c = 23$

Solve the equation.

28. $x^2 + 3x - 28 = 0$

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29. $2x^2 + 3x - 14 = 0$

Simplify.

30. $\sqrt{196}$

31. $\sqrt{\dfrac{245}{64}}$

32. $(2i)(-3i)(4i)$

33. i^7

34. $(11+i)+(3-15i)$

35. $(11-12i)+(21-8i)$

36. $(8+10i)(5-8i)$

37. $(-4+4i)(-3-3i)$

38. $\dfrac{3}{6+7i}$

39. $\dfrac{6-3i}{8-11i}$

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40. $\sqrt{25x^{20}y^{14}}$

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41. $\sqrt[4]{81a^{32}b^{20}}$

Find the exact solution of the following quadratic equation by using the Quadratic Formula.

42. $-x^2 + 3x + 7 = 0$

Simplify the given expression. Assume that no variable equals 0.

43. $\left(19x^{-6}y^{11}\right)\left(-6xy^5\right)$

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44. $14x\left(4xy^{14}\right)\left(-4x^{-10}y^7\right)$

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45. $\left(\dfrac{32x^{18}y^{10}}{16x^9y^{20}}\right)^2$

46. $\left(\dfrac{20x^{20}y^{9}}{40x^{7}y^{13}} \right)^{4}$

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47. Simplify $\sqrt{72x^{5}y^{12}}$.

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48. What is $\sqrt{4116}$ divided by $\sqrt{7}$?

Simplify.

49. $\sqrt{162} + \sqrt{32} - \sqrt{50}$

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50. $\sqrt{192} - \sqrt{245} + \sqrt{27} + \sqrt{80}$

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51. $\left(5 + \sqrt{5} \right)\left(7 - \sqrt{2} \right)$

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52. $\left(\sqrt{16} - \sqrt{8} \right)^{2}$

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53. $\dfrac{\sqrt{11}}{6 - \sqrt{5}}$

54. $\dfrac{3+\sqrt{5}}{4-\sqrt{5}}$

Simplify each expression.

55. $\left(y^{\frac{3}{4}}\right)^{\frac{7}{8}}$

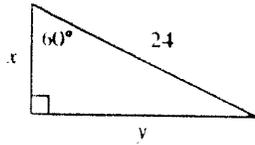56. $\dfrac{b^{\frac{2}{3}}}{b^{\frac{1}{7}}}$

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57. $\sqrt[4]{49}$

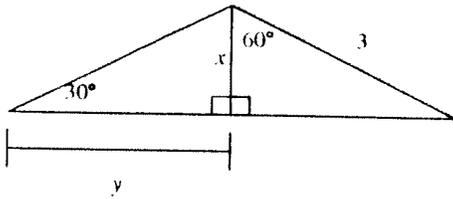*Solve the given equation.*

58. $6+\sqrt{6x+2}=18$

Simplify the given expression.
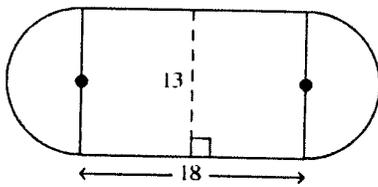
59. $17+\dfrac{2a}{11b}$

60. Find x and y.

$60°$ 24

x

y

61. Find x and y.
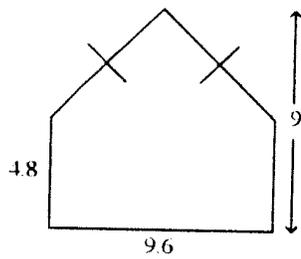

$30°$ $60°$ 3

x

y

Find the area of the figure. Round to the nearest tenth if necessary.
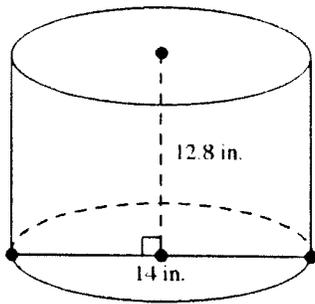
62.

13

18

63.

9

4.8

9.6

11

Find the volume of the cylinder. Use 3.14 for π. Round to the nearest tenth.

64.

12.8 in.

14 in.

Find the volume of the cone. Use 3.14 for π. Round to the nearest tenth.

65.

37 m

24 m