Discrete Math Summer Assignment

The purpose of this summer assignment is to review and strengthen mathematical skills essential for success in Discrete Math. The assignment consists of math concepts taught in previous courses you have taken.

TUTORIAL HELP SITES: if you have difficulty, the following websites provide tutorials and videos to assist as you review:

https://www.khanacademy.org/

http://www.purplemath.com/

Discrete Summer Assignment

Name: _____ **Date:** _____

1. Solve for x: $5x + 7 = 2x - 2$ 1. _____

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

3. Solve for x: $4(2x - 1) = 2x + 35$ 3. _____

4. Solve for x: $9x - 4(x - 3) = 72$ 4. _____

5. The solution set of the equation $x^2 - 4x = 0$ is 5. _____

   A. $\{0, 4\}$ B. $\{4, -4\}$ C. $\{-4\}$ D. $\{4\}$

6. The solution set of the equation $x^2 - x - 6 = 0$ is 6. _____

   A. $\{6, -1\}$ B. $\{3, -2\}$ C. $\{2, -3\}$ D. $\{-6, 1\}$

7. Solve for the positive value of x: $x^2 + 4x - 21 = 0$ 7. _____

8. Solve for the positive value of x: $x^2 - 49 = 0$ 8. _____

9. What is the solution set of the equation $3x^2 = 48$? 9. _____

   A. $\{-2, -8\}$ B. $\{2, 8\}$ C. $\{4, -4\}$ D. $\{4, 4\}$

10. For which equation is the solution set $\{-5, 2\}$? 10. _____

A. $x^2 + 3x - 10 = 0$ B. $x^2 - 3x = 10$

C. $x^2 + 3x = -10$ D. $x^2 - 3x + 10 = 0$

11. What are the roots of the equation $x^2 - 10x + 21 = 0$? 11. _____

A. 1 and 21 B. -5 and -5 C. 3 and 7 D. -3 and -7

12. The solution to the quadratic equation $2x^2 + 5x - 1 = 0$ is 12. _____

A. $\frac{5 \pm \sqrt{17}}{4}$ B. $\frac{-5 \pm \sqrt{17}}{4}$ C. $\frac{5 \pm \sqrt{33}}{4}$ D. $\frac{-5 \pm \sqrt{33}}{4}$

13. What are the values of x in the equation $x^2 + 4x - 1 = 0$? 13. _____

A. $-4 \pm \sqrt{5}$ B. $-4 \pm \sqrt{3}$ C. $-2 \pm \sqrt{5}$ D. $-2 \pm \sqrt{3}$

14. In a class of 24 students, 25% of them failed a test. How many students failed the test? 14. _____

15. A basketball player made 9 out of 12 foul shots. What percent of his foul shots did he make? 15. _____

16. If 75% of a number is 60, what is the number? 16. _____

17. In a recent town election, 1,860 people voted for either candidate A or candidate B for the position of supervisor. If candidate A received 55% of the votes, how many votes did candidate B receive? 17. _____

A. 186 B. 837 C. 1,023 D. 1,805

18. The expression $2^3 \cdot 4^2$ is equivalent to 18. _____

A. 2^7 B. 2^{12} C. 8^5 D. 8^6

19. What is half of 2^6? 19. _____

A. 1^3 B. 1^6 C. 2^3 D. 2^5

20. The expression $\frac{(10w^3)^2}{5w}$ is equivalent to 20. _____

A. $2w^5$ B. $2w^8$ C. $20w^5$ D. $20w^8$

21. Which number is equal to 3.6×10^5? 21. _____

A. 360,000 B. 3,600,000 C. 0.000036 D. 0.0000036

22. Which expression represents the number 0.00017 written in scientific notation? 22. _____

A. 1.7×10^{-4} B. 1.7×10^4 C. 1.7×10^{-3} D. 1.7×10^3

23. If the number 172,000,000 is expressed in the form 1.72×10^n, what is the value of n? 23. _____

24. Which expression has the *smallest* value? 24. _____

A. $-\pi$ B. $-\sqrt{10}$ C. $\frac{-16}{5}$ D. -3.02

25. Which number is the largest? 25. _____

A. $\left(\frac{1}{4}\right)^{-1}$ B. $\left(\frac{1}{4}\right)^{0}$ C. $\left(\frac{1}{4}\right)^{\frac{1}{2}}$ D. $\left(\frac{1}{4}\right)^{2}$

26. The sum of $\sqrt{12}$ and $5\sqrt{3}$ is 26. _____

A. $10\sqrt{3}$ B. $7\sqrt{6}$ C. $7\sqrt{3}$ D. 360

27. The expression $\sqrt{500}$ is equivalent to 27. _____

A. $50\sqrt{10}$ B. $5\sqrt{10}$ C. $10\sqrt{5}$ D. $10\sqrt{50}$

28. The sum of $\sqrt{75}$ and $\sqrt{3}$ is 28. _____

A. 15 B. 18 C. $6\sqrt{3}$ D. $\sqrt{78}$

29. The expression $\frac{6\sqrt{20}}{3\sqrt{5}}$ is equivalent to 29. _____

A. $3\sqrt{15}$ B. $2\sqrt{15}$ C. 8 D. 4

30. The expression $\sqrt{28} - \sqrt{7}$ is equivalent to 30. _____

A. $\sqrt{7}$ B. 2 C. $3\sqrt{7}$ D. 4

31. If $x \neq 2$, then $\frac{x^2-4}{2x-4}$, in simplest form, is equivalent to 31. _____

A. x B. $\frac{x}{2}$ C. $\frac{x-2}{2}$ D. $\frac{x+2}{2}$

32. Solve for a in terms of b and c: $3a + 4b = c$ 32. _____

33. If $V = \ell wh$, what is the value of V when $\ell = 2$, $w = 3$, and $h = 4x$? 33. _____

A. $9x$ B. $24x$ C. $5 + 4x$ D. $6 + 4x$

34. Solve for r in terms of d and t: $d = rt$ 34. _____

35. Expressed in simplest form, $\frac{x^2 - 64}{x^2 - 16x + 64}$, $x \neq 8$, is equivalent to 35. _____

A. 1 B. -1 C. $\frac{x-8}{x+8}$ D. $\frac{x+8}{x-8}$

36. Expressed in simplest form, $\frac{2x^2 - 32}{4x - 16}$ is equivalent to 36. _____

A. $\frac{x+4}{2}$ B. $\frac{x-16}{2}$ C. $\frac{x+16}{4}$ D. $x + 4$

37. The inequality $3x + 2 > x + 8$ is equivalent to 37. _____

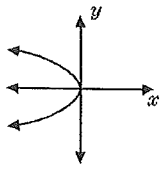
A. $x > -\frac{3}{2}$ B. $x > \frac{3}{2}$ C. $x > 3$ D. $x < 3$

38. Which is the greatest integer that makes the inequality $3 - 2x > 9$ a true statement? 38. _____

A. -2 B. 2 C. 5 D. -4

39. Which graph represents a function? 39. _____

A.



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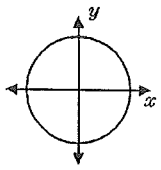

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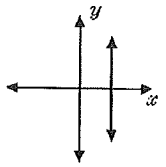

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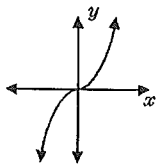


40. Which is the equation of a line whose slope is -2 and whose y-intercept is 3? 40. _____

A. $y = -2x + 3$ B. $y = 3x - 2$ C. $y = 3x + 2$ D. $y = 2x - 3$

41. Write an equation of the line whose slope is 2 and whose y-intercept is -3. 41. _____

42. Solve the following system of equations for x: 42. _____

$x + y = 6$
$x - y = 2$

43. Solve the following system of equations for x: 43. _____

$3x + y = 9$
$2x - y = 6$

44. Which polygons are *always* similar? 44. _____

A. parallelograms B. rhombuses

C. rectangles D. equilateral triangles

45. If two isosceles triangles have congruent vertex angles, the triangles must be 45. _____

A. congruent B. equilateral C. right D. similar

46. In a right triangle, if the length of the hypotenuse is 15 and the length of one leg is 12, find the length of the other leg. 46. _____

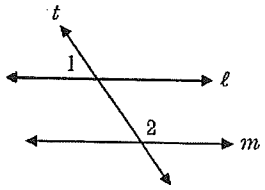
47. In the accompanying diagram, parallel lines ℓ and m are cut by transversal t. Which statement about angles 1 and 2 must be true? 47. _____

A. $\angle 1 \cong \angle 2$

B. $\angle 1$ is a complement to $\angle 2$

C. $\angle 1$ is a supplement to $\angle 2$

D. $\angle 1$ and $\angle 2$ are right angles



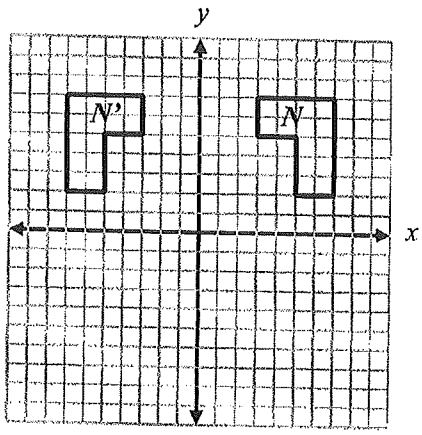
48. Two angles are complementary. If the measure of one angle is 20° more than the measure of the second angle, what is the number of degrees in the measure of the *smaller* angle? 48. _____

49. In two supplementary angles, the measure of one angle is 6 more than twice the measure of the other. The measures of these two angles are 49. _____

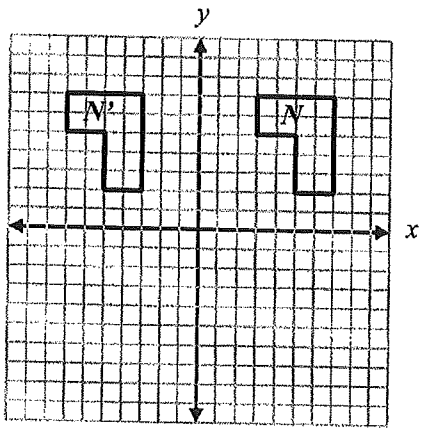
A. 26° and 62° B. 32° and 58° C. 58° and 122° D. 62° and 118°

50. Which of the following is a single reflection of figure N over the y-axis to form N'? 50. _____

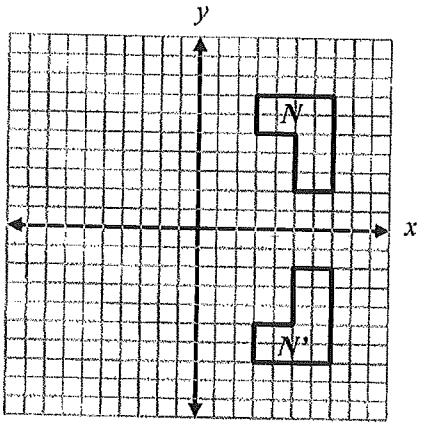
A.



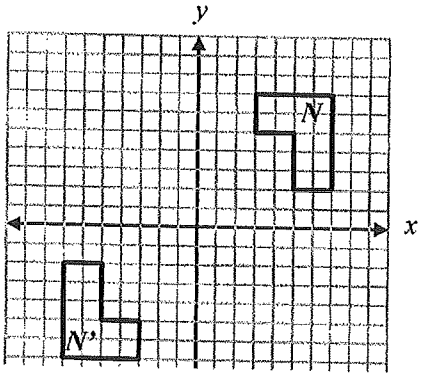
B.



C.



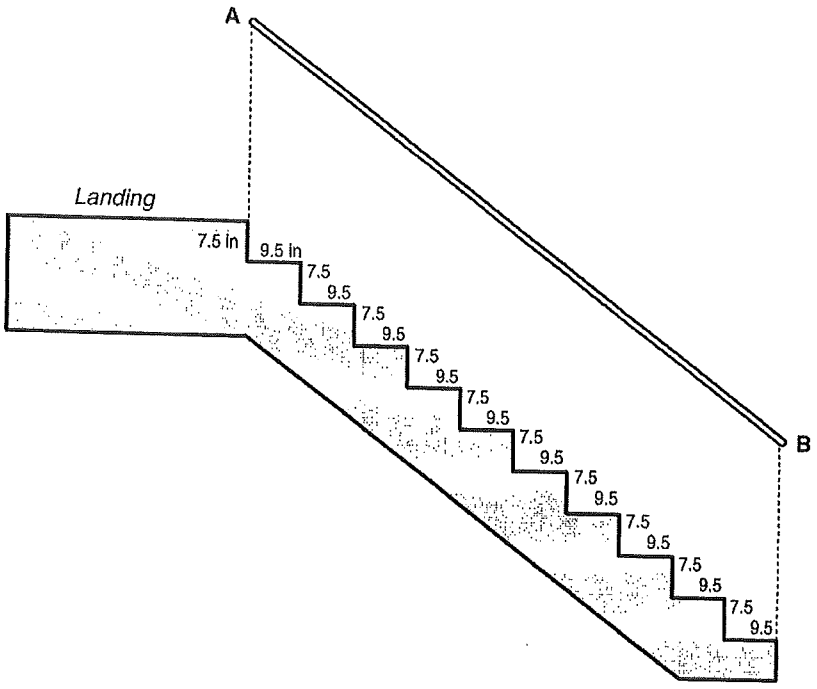
D.



51. **Stair Railing**

51. _____

Thuan plans to add a railing parallel to a flight of stairs that goes down to the cellar in his house. The stairs have the dimensions shown in the sketch below.

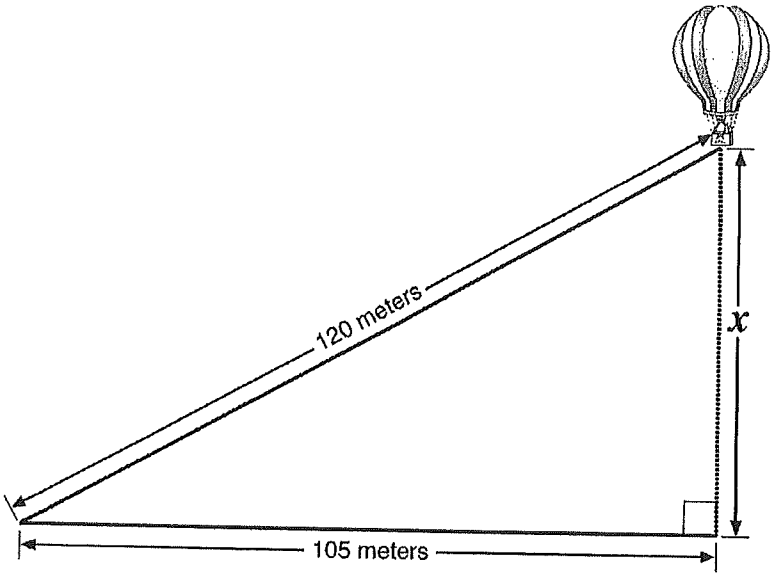


What will be the length of the railing from Point A to Point B? Show or explain how you got your answer.

52. **Hot Air Balloon**

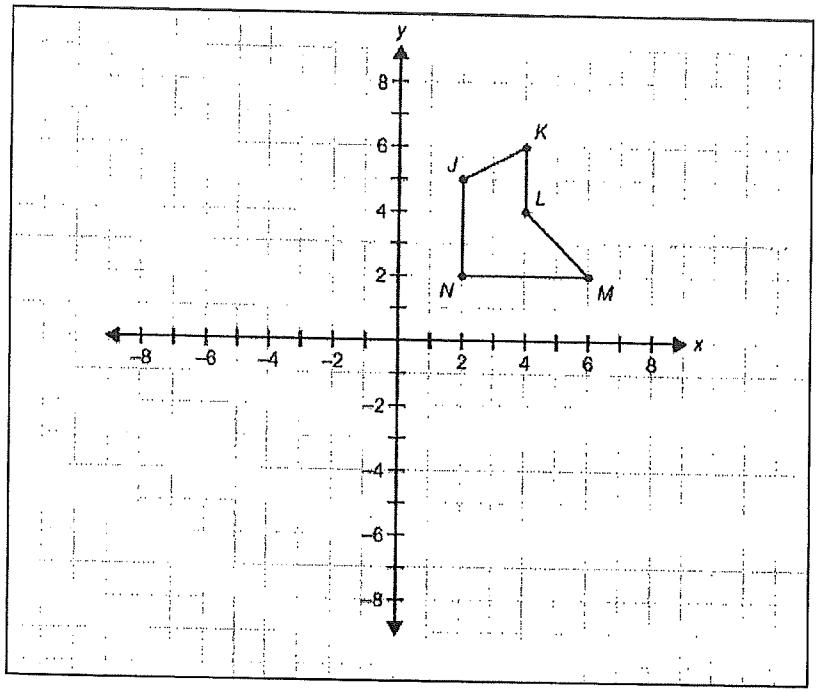
52. _____

The diagram shows a hot-air balloon tied to the ground by a rope.



To the nearest meter, what is x, the distance from the balloon to the ground?

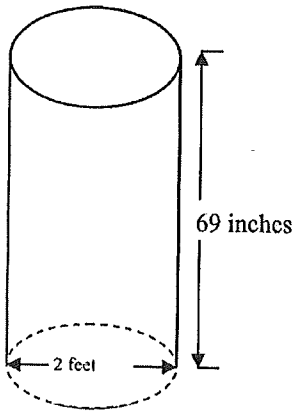
53. Pentagon JKLMN is shown on the coordinate grid. The pentagon is rotated 90° counterclockwise about the origin to create pentagon J'K'L'M'N'. 53. _____



Draw and label pentagon J'K'L'M'N'.

54. Look at the drawing of a cylindrical water heater below. 54. _____

Cyclindrical Water Heater

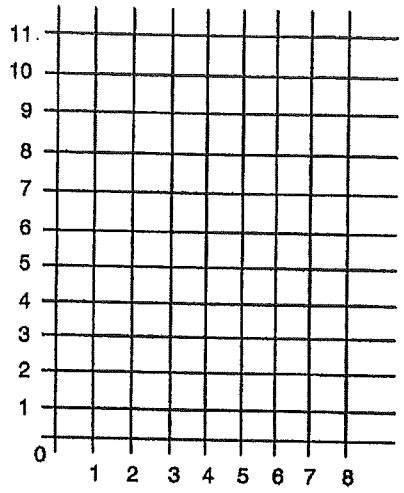


How much water, in *cubic inches*, can the water heater hold when full? Round your answer to the nearest cubic inch. Show or explain how you got your answer.

55. Complete the table below. The rule is add 4. 55. _____

x	y
1	
3	
5	
7	

On the graph below, plot the points from the table.



If you connect these points, which of the following would you see?

A. rectangle B. circle C. line segment D. ray