

Geometry Summer Assignment

Directions: This assignment consists of two parts; the **Prerequisite Skills Test**, and the **Logic and Problem Solving Exercises**, both contained within this packet. Please complete all of the exercises in this packet. Neatly label and show your work and indicate your answer in the space provided. If you need additional space, attach notebook or graph paper with your work clearly labeled. This packet will be collected within the first few days of school, and you may have a test on the material within the first few weeks of school.

**Skills
Test**

Prerequisite Skills Test

Simplify the expression.

1. $|3 - 7|$

2. $|-2 - 5|$

3. $|1 + (-8)|$

4. $|10 - (-7)|$

5. $|-6 + 5|$

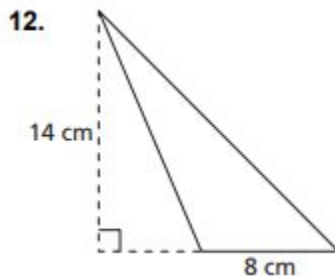
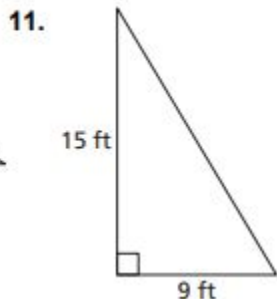
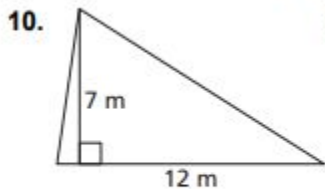
6. $|2 + 12|$

7. $|-7 + (-4)|$

8. $|0 - 11|$

9. $|-2 - (-13)|$

Find the area of the triangle.



Solve the literal equation for x .

19. $3y = 3x + 1$

20. $3y - 4x = 12$

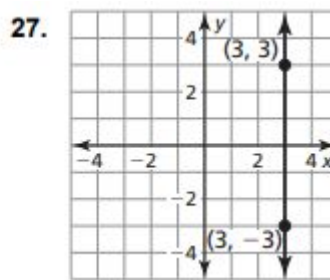
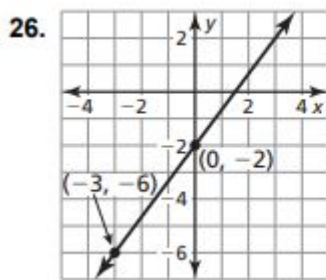
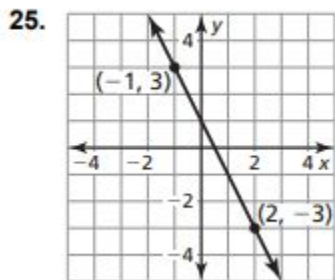
21. $2y - 6 = 5x + 8$

22. $2x + y = 6$

23. $y = zx - 2x + 5$

24. $z = 3x + 2xy$

Find the slope of the line.



Write an equation of the line that passes through the given point and has the given slope.

28. $(1, 4); m = -1$

29. $(-1, -5); m = \text{undefined}$

30. $(2, 3); m = 3$

31. $(-5, 3); m = 0$

32. $(-2, 1); m = -\frac{5}{2}$

33. $(-4, -4); m = \frac{1}{2}$

Solve the equation.

40. $7x + 3 = 4x$

42. $4m - 11 = 2m + 21$

44. $-x - 1 = -3x - 7$

41. $13 - y = 12y$

43. $3w - 5 = -5w + 11$

45. $g - 10 = 8g - 10$

Write the sentence as an inequality.

51. A number x is greater than 6 but less than 10.
52. A number y is at most 2 or at least 5.
53. A number b is less than or equal to -4 or greater than 0.
54. A number k is more than -7 and less than -1 .

Solve the equation by interpreting the expression in parentheses as a single quantity.

55. $2(x + 5) = 12$

56. $2 + 6(7 - x) = 20$

57. $3(x - 2) + 7(x - 2) = 30$

58. $-4 - 2(3 - x) = -2(x + 3)$

Simplify the expression.

61. $\sqrt{48}$

62. $\sqrt{216}$

63. $\sqrt{108}$

64. $\frac{5}{\sqrt{3}}$

65. $\frac{8}{\sqrt{2}}$

66. $\frac{10}{\sqrt{5}}$

Solve the proportion.

70. $\frac{4}{k} = \frac{2}{9}$

71. $\frac{2}{8} = \frac{5}{k-8}$

72. $\frac{3a+8}{6} = \frac{10}{8}$

Find the product.

73. $(x+4)(x+2)$

74. $(m-2)(m-5)$

75. $(x-1)(2+5x)$

76. $(g+5)(4g-1)$

77. $(x+9)(x-9)$

78. $(1+3a)(5-2a)$

Find the missing dimension.

86. A rectangle has a perimeter of 68 meters and a length of 20 meters. What is the width of the rectangle?
87. A triangle has an area of 58 square centimeters and a base of 8 centimeters. What is the height of the triangle?
88. A square has a perimeter of 24 feet. What is the length of the diagonal?

Logic and Problem Solving Exercises

One of the best selling mathematics books of all time is a slim paperback called *How to Solve It*. Written by the Hungarian-American mathematician George Pólya (1887–1985), it is regarded as the first testament of mathematical problem solving. Because much of Geometry involves problem solving, the ideas in this book are extremely relevant.

At the heart of Pólya's book is a four-step method designed to guide problem solving. The method can be summarized as *Understand, Plan, Execute, Check*. Here is Pólya's four-step method with a few annotations included.

Step 1. Understand the problem. The first step in problem solving is to determine where you are going. Be sure that you understand what the problem is asking.

Read the problem carefully! If it helps, read it aloud.

Record the quantities and conditions that are given for the problem.

Identify the unknowns. Exactly what is to be determined?

Draw a picture or diagram to help you organize the information and visualize the problem.

If possible, restate the problem in different ways to clarify it.

Step 2. Plan a strategy for solving the problem. Once you understand the problem, the next step is to decide how to go about solving it. This step is the most difficult; it requires creativity, organization, and experience.

Try to think of a similar or related problem.

Map out your strategy with a flow chart or diagram.

Identify the appropriate analytical or computational tools needed for the solution.

Step 3. Execute your strategy, and revise it if necessary. After devising a strategy, the next step is to carry it out.

Keep an organized record of your work, which will be helpful if revisions are needed.

Double check each step so that you do not propagate errors to the end of the solution.

Assess your strategy as you work; if you find a flaw, return to Step 2 and revise your strategy.

Step 4. Check and interpret your result. It's tempting to stop after Step 3; however, the final step may be the most important.

Be sure that your result makes sense; for example, check that it has the expected units and that numerical values are sensible.

Recheck your calculations or find an independent way of checking the result.

Check the consistency of the result by considering special or limiting cases.

Write the solution clearly and concisely.

The following problems involve little mathematics. However, they may be challenging and they will allow you to exercise Pólya's four-step method. Write out full solutions and discuss whether and how Pólya's method was useful.

1. A lady did not have her driver's license with her when she failed to stop at a stop sign and then went three blocks down a one-way street the wrong way. A policeman saw her, but he did not stop her. Explain.
2. One of three boxes contains apples, another box contains oranges, and another box contains a mixture of apples and oranges. The boxes are labeled APPLES, ORANGES and APPLES AND ORANGES, but each label is incorrect. Can you select one fruit from only one box and determine the correct labels? Explain.
3. Three kinds of apples are all mixed up in a basket. How many apples must you draw (without looking) from the basket to be sure of getting at least two of one kind?
4. Reuben says, "Two days ago I was 20 years old. Later next year I will be 23 years old." Explain how this is possible.
5. Sven placed exactly in the middle among all runners in a race. Dan was slower than Sven, in 10th place, and Lars was in 16th place. How many runners were in the race? [8]