

I can definitely add some problems that involve both algebraic concepts (like variables and equations) and simple geometric concepts (like perimeter, area, and angles). Here are 10 new problems, mixing algebra and geometry, in the same brief format.

Algebra & Geometry Word Problems (Set 5)

No.	Problem	Setup	Answer
1	A triangle's perimeter is 33 cm. The sides are x , $x+2$, and $x+4$. Find the length of the shortest side.	$x + (x+2) + (x+4) = 33$	$3x + 6 = 33$; $3x = 27$; $x = \text{mathbf{9}}$ cm.
2	The length of a rectangle is 5 more than its width. If the perimeter is 46 units, find the width (w).	$2w + 2(w + 5) = 46$	$4w + 10 = 46$; $4w = 36$; $w = \text{mathbf{9}}$ units.
3	The area of a square is 64 sq. units. If the side length is $2x$, find the value of x .	$(2x)^2 = 64$	$4x^2 = 64$; $x^2 = 16$; $x = \text{mathbf{4}}$
4	A line segment of length 20 is divided into two parts. One part is 4 times the other. Find the length of the shorter part.	$x + 4x = 20$	$5x = 20$; $x = \text{mathbf{4}}$
5	Two complementary angles (sum to 90°) have measures x and $2x$. Find the measure of the smaller angle.	$x + 2x = 90$	$3x = 90$; $x = \text{mathbf{30}}$
6	The base of a parallelogram is x , and its height is 4. If the area is 28, find the base.	$4x = 28$	$x = \text{mathbf{7}}$
7	An isosceles triangle has two equal sides of length $2x$. The third side is 8. If the perimeter is 24, find x .	$2x + 2x + 8 = 24$	$4x = 16$; $x = \text{mathbf{4}}$
8	The measure of an angle is 10 less than its supplement (sum to 180°). Find the	$x = (180 - x) - 10$	$2x = 170$; $x = \text{mathbf{85}}$

No.	Problem	Setup	Answer
9	A trapezoid has a height of 5 and bases of length x and $x+6$. If the area is 50, find the length of the shorter base.	$\frac{1}{2}(x+6)(5) = 50$	$5(2x+6) = 100$; $10x + 30 = 100$; $10x = 70$; $x = \text{mathbf{7}}$
10	The diameter of a circle is $3x$. If the diameter is 18 cm, find x .	$3x = 18$	$x = \text{mathbf{6}}$

Let me know if you'd like more problems or another set!

Algebra problems:

* problem: The sum of three consecutive integers is 93. What are the integers?

Solution: Let the integers be $x, x+1, x+2$. The equation is

$$x + (x+1) + (x+2) = 93 \text{ which simplifies to } 3x + 3 = 93 \text{ \& solving for } x \text{ gives } x = 30. \text{ So the integers are } 30, 31, 32.$$

* problem: A train has 65 people. 19 people get off and 17 people get on. How many people are on the train now?

Solution: you can represent the problem as an equation $65 - 19 + 17$. The result is 63 people.

* problem:

* Two six-sided dice are thrown. What is the probability that the sum of the two dice is 10?

Solution: The possible outcomes that sum to 10 are $(4, 6), (5, 5), (6, 4)$ there are 3 favorable outcomes. Since there are $6 \times 6 = 36$ total possible outcomes when rolling two dice, the probability is $\frac{3}{36}$ which simplifies to $\frac{1}{12}$.

* problem: What is the area of a circle with a radius of 10 meters? (use $\pi \approx 3.14$).

Solution: The formula for the area of a circle is $A = \pi r^2$. Using the given values,

$$A = 3.14 \times (10)^2 = 3.14 \times 100 = 314 \text{ square meters}$$

* problem: A rectangular field is 40 m by 30 m. If Lind runs from one corner to the opposite corner along the two sides (From A to B to D), How far does she run?

Solution: The distance is the sum of the two sides she runs so $40 + 30 = 70$ m