

## Questions

1. Write an algebraic expression for the quantity “three more than half a number”.
2. Write an algebraic expression for the quantity “one-fifth of a number reduced by double the same number”.
3. The number of boxes of cookies sold by Sarah was 43 fewer than the number of boxes of cookies sold by Keiko. The number of boxes of cookies sold by Imelda was 53 more than the number sold by Keiko. Write algebraic expressions for these relations.
4. The first angle of a triangle is 16 degrees less than the second angle. The angle is double the second angle. Write algebraic expressions for these relations.
5. Kentucky has about half the land area of Minnesota. The land area of Maine is approximately two-fifths the land area of Minnesota. Write algebraic expressions for these relations.
6. A census of a middle school found that the number of 7th graders was fifty more than the number of eighth graders. The number of sixth graders was three-fourths the number of eighth graders. Write algebraic expressions for these relations.
7. In an archery tournament, the number of points awarded for an arrow in the gold circle (bull’s eye) is six less than triple the points awarded for an arrow in the blue ring. Write algebraic expressions for these relations.

## Solutions

In all these problems, your answers may vary.

1. Write an algebraic expression for the quantity “three more than half a number”.

Let  $x$  be the unknown number.

*half a number* is  $\frac{1}{2}x$ .

*more than* is addition.

*three more than half a number* is  $3 + \frac{1}{2}x$ .

2. Write an algebraic expression for the quantity “one-fifth of a number reduced by double the same number”.

Let  $x$  be the unknown number.

*one-fifth of a number* is  $\frac{1}{5}x$ .

*double the same number* is  $2x$ .

*reduced by* is subtraction.

*one-fifth of a number reduced by double the same number* is  $\frac{1}{5}x - 2x$ .

3. The number of boxes of cookies sold by Sarah was 43 fewer than the number of boxes of cookies sold by Keiko. The number of boxes of cookies sold by Imelda was 53 more than the number sold by Keiko. Write algebraic expressions for these relations.

Let  $x$  be the number of boxes of cookies sold by Keiko.

The number of boxes sold by Sarah is  $x - 43$ .

The number of boxes sold by Imelda is  $x + 53$ .

Other solutions are possible, but they get more complicated to figure out. For example,

Let  $y$  be the number of boxes of cookies sold by Sarah.

The number of boxes sold by Keiko is  $y + 43$  (she sold 43 more than Sarah).

The number of boxes sold by Imelda is  $y + 43 + 53 = y + 76$  (she sold 53 more than Keiko).

**4.** The first angle of a triangle is 16 degrees less than the second angle. The angle is double the second angle. Write algebraic expressions for these relations.

Let  $x$  be the second angle.

The first angle is  $x - 16$ .

The third angle is  $2x$ .

**5.** Kentucky has about half the land area of Minnesota. The land area of Maine is approximately two-fifths the land area of Minnesota. Write algebraic expressions for these relations.

Let  $A$  be the land area of Minnesota.

The land area of Maine is  $\frac{2}{5}A$ .

The land area of Kentucky is  $\frac{1}{2}A$ .

**6.** A census of a middle school found that the number of 7th graders was fifty more than the number of eighth graders. The number of sixth graders was three-fourths the number of eighth graders. Write algebraic expressions for these relations.

Let  $w$  be the number of eighth graders.

The number of seventh graders is  $50 + w$ .

The number of sixth graders is  $\frac{3}{4}w$ .

**7.** In an archery tournament, the number of points awarded for an arrow in the gold circle (bull's eye) is six less than triple the points awarded for an arrow in the blue ring. Write algebraic expressions for these relations.

Let  $x$  be the number of points for an arrow in the blue ring.

Then the points for an arrow in the gold ring is  $3x - 6$ .