Grade 7 Maths Worksheet
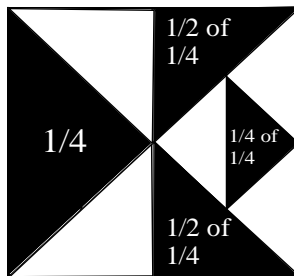
Fractions and operations

Questions:

1.

Above is a square with sides measuring 4 cm each.

a)   What fraction of the square is shaded black?

b)   What fraction of the square is shaded by the 3 small white triangles?

c)   What is the ratio of white area to black area in this triangle?

Solution

1. a)

$$\frac{1}{4} + 2 \times \frac{1}{2} \times \frac{1}{4} + \frac{1}{4} \times \frac{1}{4}$$

$$= \frac{1}{4} + \frac{1}{4} + \frac{1}{16}$$

$$= \frac{1}{2} + \frac{1}{16}$$

$$= \frac{8+1}{16}$$

$$= \frac{9}{16}$$

b) $3 \times \dfrac{1}{4} \times \dfrac{1}{4} = \dfrac{3}{16}$

c) $White = \dfrac{1}{4} + 3\left(\dfrac{1}{4} \times \dfrac{1}{4}\right) = \dfrac{7}{16} \ and \ Black = \dfrac{9}{16}$

$\therefore W:B = 7:9$

Learners make real interesting mistakes here based on various misconceptions. They will simply count the black triangles and say there are four and white ones will also be four. So the black will be 4 out of 8 which is a half.

Learners need to understand by now that the word *of* in an expression implies that the relationship is multiplicative.

Appendix of Assignment Tools
Part of a whole
Multiplying fractions
Adding fractions
Forming mathematical expressions for a geometric composition
Ratio

There is again more than one way to answer this question, and the educator needs to use all the different representations to give feedback and create understanding thorough multiple representations.