

# Varied Fluency

## Step 5: Formulae

### National Curriculum Objectives:

Mathematics Year 6: (6A1) [Express missing number problems algebraically](#)

Mathematics Year 6: (6A2) [Use simple formulae](#)

Mathematics Year 6: (6A4) [Find pairs of numbers that satisfy an equation with two unknowns](#)

Mathematics Year 6: (6A5) [Enumerate possibilities of combinations of two variables](#)

### Differentiation:

**Developing** Questions to support using simple formulae. Using all four operations with whole numbers. Some pictorials for support.

**Expected** Questions to support using simple formulae. Using all 4 operations with some decimals and fractions. Children use order of operations knowledge.

**Greater Depth** Questions to support using simple formulae. Using all 4 operations with fractions, percentages, whole and decimal numbers. Children use order of operations knowledge.

More [Year 6 Algebra](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

## Formulae

## Formulae

1a. Match each box on the left to the correct label.

$$p = a + b + c$$

formula for  
perimeter

$$36 + 56 = 92$$

calculation



VF

1b. Match each box on the left to the correct label.

$$30 = 16 + 14$$

formula for  
area

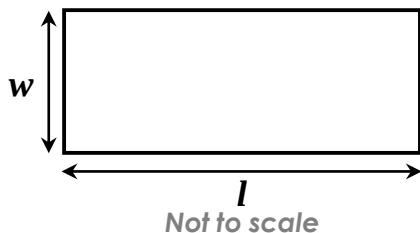
$$a = l \times w$$

calculation



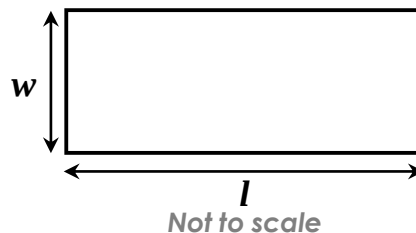
VF

2a. Work out the area (  $a$  ) of this shape using the formula  $a = w \times l$ , if  $w = 5\text{cm}$  and  $l = 8\text{cm}$ .



VF

2b. Work out the perimeter (  $p$  ) of this shape using the formula  $p = 2w + 2l$ , if  $w = 4\text{cm}$  and  $l = 9\text{cm}$ .



VF

3a. Circle the correct formula for doubling a number.

$$d = 2n$$

$$d = n \times n$$

$$d = \frac{n}{2}$$



VF

3b. Circle the correct formula for halving a number.

$$h = n \div n$$

$$h = 2n$$

$$h = n \div 2$$



VF

4a. The number of adults (  $a$  ) needed to oversee an Early Years trip is calculated as six children (  $c$  ) to each adult.

Expressed as the formula:

$$a = 6c$$

If there are 5 adults, how many children can go on the trip?



VF

4b. The number of clean towels (  $t$  ) needed by a hotel is calculated as 3 per guest (  $g$  ).

Expressed as the formula:

$$g = 3t$$

If there are 20 guests, how many clean towels will be needed?



VF

## Formulae

## Formulae

5a. Match each box on the left to the correct label.

$$9 + 3y$$

formula

$$a = l \times w$$

expression

$$25 = 100 \div 4$$

calculation



VF

5b. Match each box on the left to the correct label.

$$27 - f$$

formula

$$35 \div 7 - 3 = 2$$

expression

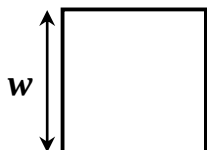
$$p = a + b + c$$

calculation



VF

6a. Work out the perimeter ( $p$ ) of this shape using the formula  $p = 4w$ , if  $w = 2.3\text{cm}$ .

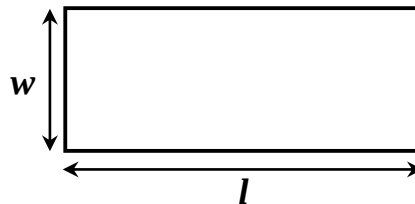


Not to scale



VF

6b. Work out the perimeter ( $p$ ) of this shape using the formula  $p = 2(w + l)$ , if  $w = 1.5\text{cm}$  and  $l = 5.2\text{cm}$ .



Not to scale



VF

7a. Circle the correct formula for finding a squared number.

$$a = 2b$$

$$a = b \times b$$

$$a = \frac{b}{2}$$



VF

7b. Circle the correct formula for finding  $\frac{1}{4}$  of a number.

$$a = n \div 25$$

$$a = 0.25n$$

$$a = \frac{n}{25}$$



VF

8a. To calculate the price of a taxi ( $p$ ), the firm decide to charge £0.75 per mile ( $m$ ).

Expressed as the formula:

$$0.75m = p$$

If a journey is 8 miles, how much will a taxi cost?



VF

8b. When baking cupcakes, Sara needs half the amount of sugar ( $s$ ) as flour ( $f$ ).

Expressed as the formula:

$$s = \frac{f}{2}$$

How much sugar will she need if she uses 250g of flour?



VF

## Formulae

## Formulae

9a. Match each box on the left to the correct label.

$$5(b - c)$$

formula

$$v = w \times h \times d$$

expression

$$a = \pi \times r^2$$

calculation

$$72 = (12 \times 3) \times 2$$



VF

9b. Match each box on the left to the correct label.

$$a = (b \times h) \div 2$$

calculation

$$p = a + b + c$$

expression

$$3(a - 3)$$

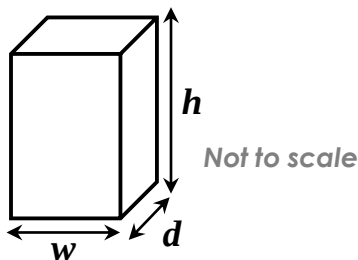
formula

$$-23 = 20 - 43$$



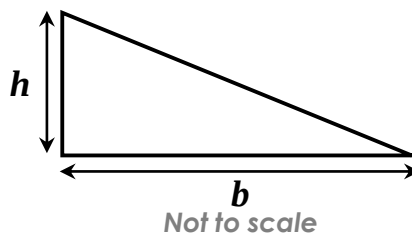
VF

10a. Work out the volume (  $v$  ) of this cuboid using the formula  $v = w \times h \times d$ , if  $w = 3\text{cm}$ ,  $h = 5.5\text{cm}$  and  $d = 2\text{cm}$ .



VF

10b. Work out the area (  $a$  ) of this shape using the formula  $a = (b \times h) \div 2$ , if  $b = 5\text{cm}$  and  $h = 3.2\text{cm}$ .



VF

11a. Circle the correct formula for doubling a number and finding 45%.

$$a = 2n \times 0.45$$

$$a = n \times 2.45$$

$$a = \frac{2n}{0.45}$$



VF

11b. Circle the correct formula for finding 125% of a number.

$$a = n \div 12.5$$

$$a = 0.125n$$

$$a = n + 0.25n$$



VF

12a. To calculate the BMI of a person, you can use their weight in kilograms and height in metres.

Expressed as the formula:

$$b = \frac{w}{h^2}$$

If someone is 2m tall (  $h$  ) and weighs 92 kg (  $w$  ), what is their BMI?



VF

12b. To work out the speed of a travelling car, you can use the distance in miles and the time in hours.

Expressed as the formula:

$$s = \frac{d}{t}$$

If a car travels 12 miles (  $d$  ) in 30 minutes (  $t$  ), what speed was it travelling at?



VF

## Varied Fluency Formulae

### Developing

1a.  $p = a + b + c$  is a formula;  $36 + 56 = 72$  is a calculation.

2a.  $40\text{cm}^2$

3a.  $d = 2n$

4a. 30 children ( $6 \times 5 = 30$ )

### Expected

5a.  $9 + 3y$  is an expression;  $a = l \times w$  is a formula;  $25 = 100 \div 4$  is a calculation.

6a.  $9.2\text{cm}$

7a.  $a = b \times b$

8a. £6 for 8 miles ( $0.75 \times 8 = 6$ )

### Greater Depth

9a.  $5(b - c)$  is an expression;  $v = w \times h \times d$  is a formula;  $a = \pi \times r^2$  is a formula;  $72 = (12 \times 3) \times 2$  is a calculation.

10a.  $33\text{cm}^3$

11a.  $a = 2n \times 0.45$

12a. 23 ( $92 \div 2^2$ )

## Varied Fluency Formulae

### Developing

1b.  $30 = 16 + 14$  is a calculation;  $a = l \times w$  is a formula.

2b.  $26\text{cm}$

3b.  $h = n \div 2$

4a. 60 towels ( $3 \times 20 = 60$ )

### Expected

5b.  $27 - f$  is an expression;  $35 \div 7 - 3 = 2$  is a calculation;  $p = a \times b \times c$  is a formula.

6b.  $13.4\text{cm}$

7b.  $a = 0.25n$

8b. 125g of sugar ( $250 \div 2 = 125$ )

### Greater Depth

9b.  $a = (b \times h) \div 2$  is a formula;  $p = a + b + c$  is a formula;  $3(a - 3)$  is an expression;  $-23 = 20 - 43$  is a calculation.

10b.  $8\text{cm}^2$

11b.  $a = n + 0.25n$

12b. 24mph ( $12 \div 0.5$ )