

## Formula for Level 1 & 2 | Functional Skills Mathematics

There are several ways in which different aspects of the syllabus can be approached and some centres may wish to use formulae not included in this list in their teaching approach.

This should **not** be viewed as an exhaustive list of all the possible formulae available to learners but should be seen as a confirmation of the requirement of the specification where formulae cannot be given.

### Use of common measures, shape and space.

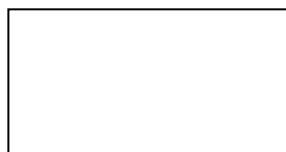
22 Calculate the area and perimeter of simple shapes including those that are made up of a combination of rectangles



Square of side length  $x$

Perimeter is  $P = 4x$

Area is  $A = x^2$



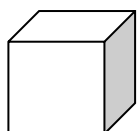
Rectangle of side length  $l$  and width  $w$

Perimeter is  $P = 2l + 2w$  or  $2(l + w)$

Area is  $A = lw$

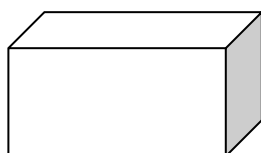
NOTE combinations of rectangles may be set.

23 Calculate the volumes of cubes and cuboids



Cube of side length  $x$

Volume  $= x^3$



Cuboid of side length  $l$ , width  $w$  and height  $h$

Volume  $= lwh$

### Handling information and data

29 Find the mean and range of set of quantities

Mean  $= \frac{\sum x}{n}$

Range = highest value – lowest value

## Level 2

There are several ways in which different aspects of the syllabus can be approached and some centres may wish to use formulae not included in this list in their teaching approach.

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### Use of common measures, shape and space.

13 Calculate amounts of money, compound interest.....

Final value of an investment with an initial investment of £ $x$  and compound interest at a rate of  $r\%$  invested for  $n$  years

$$x \left( \frac{100 + r}{100} \right)^n$$

15 Calculate using compound measures including speed, density and rates of pay.

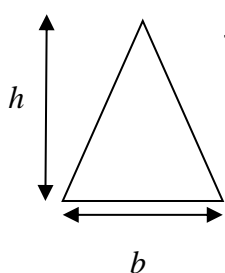
$$\text{Speed} = \frac{\text{distance}}{\text{time}} \quad \text{Hourly rate} = \frac{\text{pay}}{\text{hours worked}}$$

It will be useful for learners to be familiar with

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

16 Calculate perimeters and areas of 2-D shapes including triangles and circles and composite shapes including non-rectangular shapes (formulae given except for triangles and circles)

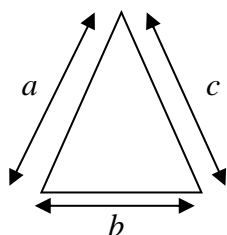
ASSUMED knowledge from level 1 for cubes and cuboids (see level 1 formulae).



Triangle of perpendicular height  $h$  and base length  $b$ .

$$\text{Area} \frac{bh}{2}$$

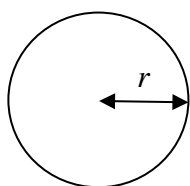
Note different triangles may be set e.g. right angled, isosceles equilateral and scalene.



Triangle of side lengths  $a$ ,  $b$  and  $c$ .

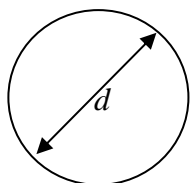
$$\text{Perimeter} = a + b + c$$

Note different triangles may be set e.g. right angled, isosceles equilateral and scalene.



Circle with radius of length  $r$

$$\text{Circumference} = 2\pi r \quad \text{Area} = \pi r^2$$



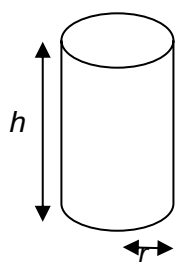
Circle with diameter of length  $d$

$$\text{Circumference} = \pi d \quad \text{Area} = \pi \left(\frac{d}{2}\right)^2$$

NOTE combinations of shapes may be set.

17 Use of formulae to find volumes and surface areas of 3-D shapes including cylinders (formulae to given for shapes other than cylinders)

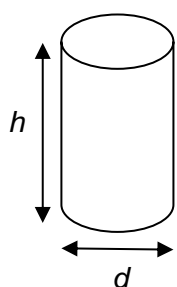
ASSUMMED knowledge from level 1 for cubes and cuboids (see level 1 formulae).



Cylinder with radius of length  $r$  and height of length  $h$

$$\text{Volume} = \pi r^2 h$$

$$\text{Surface area} = 2\pi r^2 + 2\pi r h$$



Cylinder with diameter of length  $d$  and height of length  $h$

$$\text{Volume} = \pi \left(\frac{d}{2}\right)^2 h$$

$$\text{Surface area} = 2\pi \left(\frac{d}{2}\right)^2 + \pi d h$$

## Handling information and data

24 Estimate the mean of grouped frequency distribution from discrete data

Mean of discrete data  $\frac{\sum fx}{\sum f}$

Estimate of the mean for grouped discrete data  $\frac{\sum fx_m}{\sum f}$  where  $x_m$  is the midpoint of the group