Functional Skills: using formulas (L2)

Name _____ Date _____

1 A mechanic tests the headlamps on a car.

$$I = \frac{P}{V}$$

I = Current in amps
P = Power in watts
V = Voltage in volts

Each headlamp uses 100 watts of power.
The voltage is 12 volts.

The current used by each headlamp is

A 0.12 amps
B 0.83 amps
C 1.2 amps
D 8.3 amps

2 The temperature in Sydney one morning is 104^0F.
You can convert this temperature to degrees Celsius using the formula

$$C = \frac{5(F-32)}{9}$$

Where C is the temperature in degrees Celsius

and

F is the temperature in degrees Fahrenheit

What is 104^0 Fahrenheit in degrees Celsius?

A 26^0C
B 40^0C
C 54^0C
D 86^0C

3 The drawing shows a cylindrical aquarium.

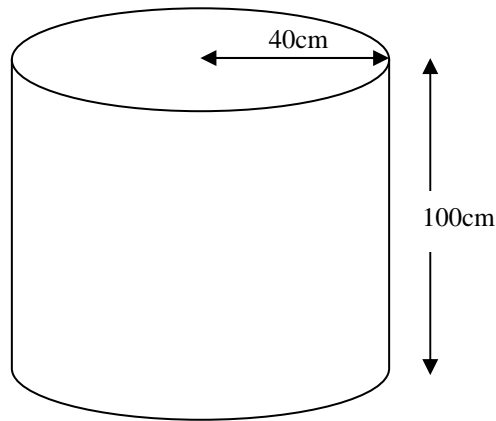The aquarium has a radius of 40 centimetres and a height of 100 centimetres.

40cm

Diagram not to scale

100cm

The formula gives the volume V of water in litres in the aquarium.

$$V = \frac{3r^2h}{1000}$$
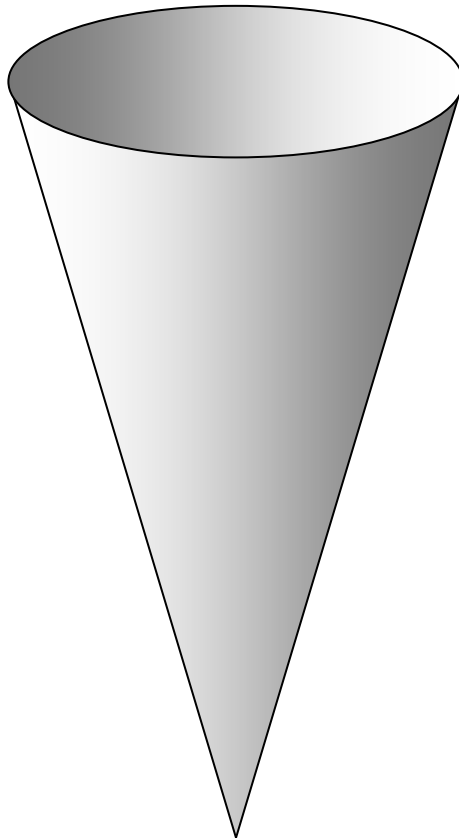
where r is the radius in centimetres
h is the height in centimetres

The aquarium is full of water.

What is the volume of water in the aquarium?

A	160 litres
B	240 litres
C	480 litres
D	1440 litres

Name _____ Date _____

4   An association organises a summer party for the children of its members.
They give each child a cornet full of ice cream.
The radius of the cornet cone is 4 centimetres and the height 9 centimetres.

Volume of a cone = 1/3 x π x r^2 x d
where r is the radius and
        d is the depth of the cone.

Use the approximation π = 3

What is the volume of the cornet cone?

A   72cm^3
B   144cm^3
C   216cm^3
D432cm^3

5 Fuel consumption is in **litres pre 100 kilometres** in Europe.
An approximate formula to convert from miles per gallon to litres per 100 kilometres is

$$L = \frac{280}{M}$$

L = number of litres per 100 kilometres
M = number of miles per gallon

A car travels 35 miles per gallon.

What is this in litres per 100 kilometres?

A	125
B	80
C	12.5
D	8

**6** The final speed of an accelerating vehicle can be found using the formula:

v = u + at

where v = final speed, u = initial speed, a = acceleration and t = time taken.

A car is travelling at 20 $kmhr^{-1}$ when the driver decides to overtake a lorry.

What is the final speed of the vehicle if the initial speed is 20 $kmhr^{-1}$, the acceleration is 5kms^{-2}, and the time is four seconds?

A	40 $kmhr^{-1}$
B	80 $kmhr^{-1}$
C	100 $kmhr^{-1}$
D	120 $kmhr^{-1}$

7   A garden designer plans a flower bed.
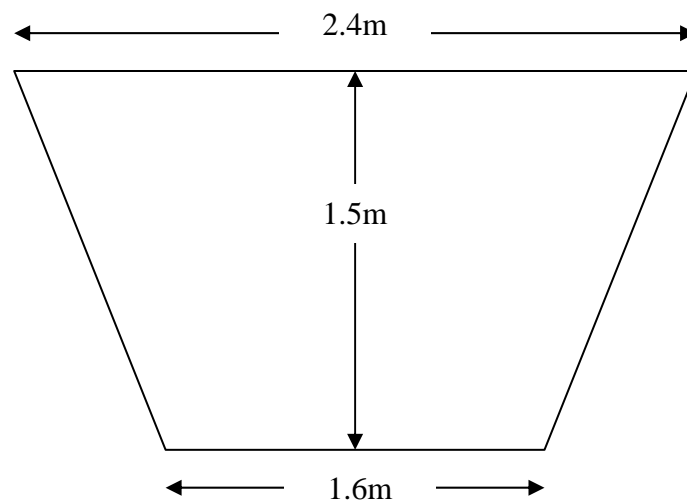
She uses the formula below to work out the area in square metres of the flower bed so she can apply some soil treatment.

$$\text{Area} = \tfrac{1}{2}\,(a + b)\,h$$
$$a = 2.4$$
$$b = 1.6$$
$$h = 1.5$$

What is the area of the flower bed?

A   3.0m^2

B   3.5m^2

C   3.6m^2

D   4.2m^2

Questions 8 and 9 refer to electrical fuses.

Fuses are available in various sizes for different electrical appliances.
The correct fuse size for an appliance can be calculated using the formula

$$I = W \div 220$$

where I is the fuse size in Amps and W is the power rating in Watts.

8   A fan heater has a power rating of 2860 Watts.
      What is the size of fuse needed?

   A   0.13 amps
   B   13 amps
   C   0.08 amps
   D   8 amps

9   A Hi-Fi system needs a 3 Amp fuse.
      Calculate the power rating of the Hi-Fi system.

   A   1400 Watts
   B   14 Watts
   C   6600 Watts
   D   660 Watts

10   The formula for calculating simple interest is

$$I = \frac{PRT}{100}$$

I is the interest earned, P is the principal invested, R is the rate, and T is the time period.

Find I when P = £2000, R = 3% and T = 4 years.

   A   £2.40

   B   £24

   C   £240

   D   £2400

11 The owner of a guesthouse receives a gas bill.
It is calculated using the formula

$$\text{Cost of gas in pounds} = \frac{8d + u}{100}$$

d = the number of days
u = the number of units

She used 3 000 units of gas in 90 days.
How much is her bill?

A   £30.98
B   £37.20
C   £128.00
D   £247.20

12 After finishing her course a student earns £15 000 in her first year of work.

She makes a monthly repayment of her loan.
She works out the monthly amount using the formula

$$R = \frac{(S - 10\ 000) \times 0.09}{12}$$

R is the monthly repayment in pounds
S is her annual salary in pounds

What is her monthly repayment?

A   £37.50
B   £112.50
C   £375.00
D   £450.00