Starter - NO Calculators

1) Find 20% of 248

$\frac{1}{5}$ of 248
10% → 24·8
20% → 49·6

2) Find $3\frac{1}{5} - 1\frac{3}{4}$

$\frac{16}{5} - \frac{7}{4}$
$\frac{64}{20} - \frac{35}{20}$
$= \frac{29}{20} = 1\frac{9}{20}$

3) Find the highest common factor of 14 and 49.

7

4) Find 35% of £80.

10% → £8
30% → £24
5% → £4
£28

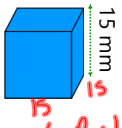
5) Calculate 256 ÷ 64

$\frac{256}{64}$
$= \frac{128}{32} \div 2$
$= \frac{64}{16} = 4$

Today's Learning:

To revise volume of cubes, cuboids and prisms.

1) Find the volume of this cube in mm³:

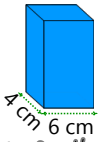


15
$V = L \times B \times H$
$= 15 \times 15 \times 15$
$= 3375 mm^3$

2) Find the volume of this carton in ml:

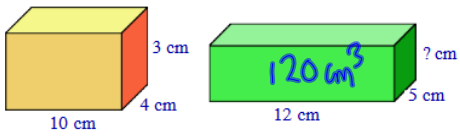
$V = L \times B \times H$
$= 6 \times 3 \times 12$
$= 216 cm^3$
$= 216 ml$

3) If the volume of this cuboid is 432 ml, find its height.



$V = L \times B \times H$
$432 = 4 \times 6 \times H$
$432 = 24 \times H$
$H = 18 cm$

. These 2 cuboids have the **SAME** volume.



Calculate the height of the **green** cuboid.

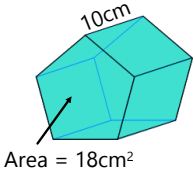
$12 \times 5 \times h = 120$
$60 \times h = 120$
$h = 2cm$

Volume of Prisms 6/5/17

A prism has the same cross-section all the way through its height.

Volume = cross section area x height

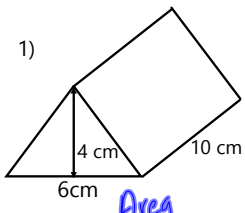
E.g. 1)



$V = Area \times height$
$= 18 \times 10$
$= 180 cm^3$

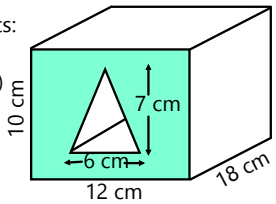
Find the volume of these objects:

1)



Area
$A = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 6 \times 4$
$= 12 cm^2$
$Volume = Area \times h$
$= 12 \times 10$
$= 120 cm^3$

2)



Cuboid: $V = L \times B \times H$
$= 10 \times 12 \times 18$
$= 2160 cm^3$

Δ Area $= \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 6 \times 7$
$= 21 cm$

$V = A \times h$
$= 21 \times 18$
$= 378 cm^3$

Starter

1) Find two thirds of 417.

$\frac{2}{3}$ of 417 $= 417 \div 3 = 139$, $2 \times 139 = 278$

2) Multiply out the brackets: -4(y + 3)

$-4y - 12$

3) Simplify the fraction: $\frac{-513}{-3} = \frac{513}{3} = 171$

4) Calculate 2 + 3(1 + 3²) - 3 x 6

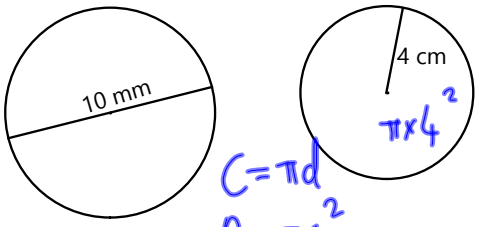
$= 2 + 3(10) - 3 \times 6$

$= 2 + 30 - 18$

$= 32 - 18 = 14$

Circle Revision

Find the circumference and the area of these circles:



$C = \pi d$

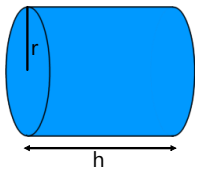
$A = \pi r^2$

$\pi \times 4^2$

Volume of a Cylinder

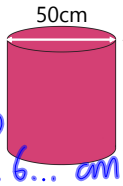
$V = \pi r^2 h$

*not given in exams



Example 1:

Find the volume in litres, to 3 sig. fig.



$V = \pi r^2 h$

$= \pi \times 25 \times 70$

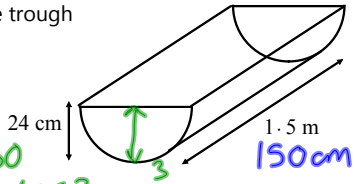
$= 137444.6\ldots\ cm^3$

$= 137\,000\ cm^3$ (3 s.f.)

$= 137\,000$ ml

$= 137$ litres

2) Find the volume of the trough in litres, correct to 2 d.p.



$V = \pi r^2 h$

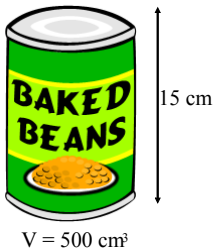
$= \pi \times 24^2 \times 150$

$= 271433.6053\ cm^3$

$= 271\,433.6053$ ml

$= 271.43$ litres (2 dp)

$\div 2$ trough: 135.72 litres



$V = 500\ cm^3$

Find the radius of the can.

$V = \pi r^2 h$

$500 = \pi \times r^2 \times 15$

$500 = \pi \times 15 \times r^2$

$500 = 47.12 \times r^2$

$\div 47.12 \quad \div 47.12$

$10.61 = r^2$

$r = 3.3$ cm (1 dp)

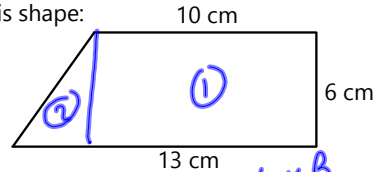
Starter

1) Calculate $2 \times 3 + 2 \times 2^2$ $= 2 \times 3 + 2 \times 4$

$= 6 + 8 = 14$

2) Calculate $\frac{3}{4} + \frac{1}{5}$ $= \frac{15}{20} + \frac{4}{20} = \frac{19}{20}$

3) Find the area of this shape:



② $A = \frac{1}{2} \times B \times H$

$= \frac{1}{2} \times 3 \times 6$

$= 9\ cm^2$

① $A = L \times B$

$= 10 \times 6$

$= 60\ cm^2$

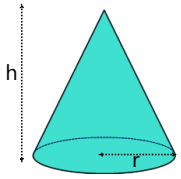
Total Area $= 69\ cm^2$

Today's Learning:

To calculate the volume of any cone.

Volume of a Cone

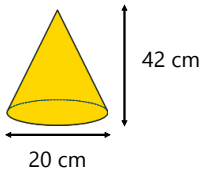
7/6/17



$$V = \frac{1}{3}\pi r^2 h$$

*given in exams

e.g. 1) Calculate the volume of this cone.



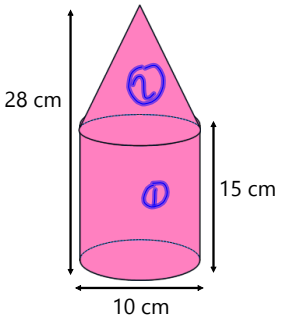
$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 10^2 \times 42$

$= 4398.229\ldots cm^3$

$= 4400 cm^3$ (2 s.f.)

Calculate the volume of this shape.



② $V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 5^2 \times 13$

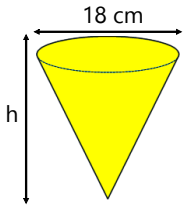
$= 340$

① $V = \pi r^2 h$

$= \pi \times 5^2 \times 15$

$= 1178$

Total $= 1518.4 cm^3$



$10 = 2 \times h$

This cone has volume 2000 cm^3. Calculate the height of the cone.

$V = \frac{1}{3}\pi r^2 h$

$2000 = \frac{1}{3} \times \pi \times 9^2 \times h$

$2000 = 84.8 \times h$

$\div 84.8$

$23.6 cm = h$

Starter

1) Multiply out the brackets: $-4(2 - R)$ $= -8 + 4R$

2) Evaluate $\frac{3}{4} \div \frac{2}{3}$ $= \frac{3}{4} \times \frac{3}{2} = \frac{9}{8}$

3) Find four fifths of £320

$\frac{1}{5} \rightarrow £64$ £256

4) Solve the equation: $2(3 - f) = 4f + 11$

$6 - 2f = 4f + 11$

$-4 \quad -8$

$-2f = 4f + 5$

$+2f \quad +2f$

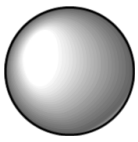
$0 = 6f + 5$

$-5 = 6f$

$\frac{-5}{6} = f$

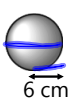
Volume of a Sphere

8/6/17



$$V = \frac{4}{3}\pi r^3$$

e.g. 1) Find the volume of this sphere.



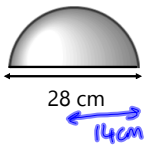
$V = \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \pi \times 6^3$

$= 904.77\ldots cm^3$

$= 905 cm^3$ (3 s.f.)

e.g. 2) Find the volume of this hemisphere.



$V = \frac{4}{3} \times \pi \times r^3$

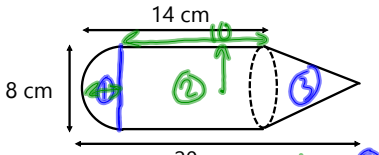
$= \frac{4}{3} \times \pi \times 14^3$

$= 11\,494.04\ldots$

$\div 2$ Volume $= 5747.0\ldots cm^3$

$= 5700\,cm^3$ (2sf)

Find the volume of this object, made up of a hemisphere, a cylinder and a cone:



① $V = \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \pi \times 4^3$

$= 268\,cm^3$

$\div 2$ $134\,cm^3$

② $V = \pi r^2 h$

$= \pi \times 4^2 \times 10$

$= 503\,cm^3$

③ $V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 4^2 \times 6$

$= 101\,cm^3$

Total: $738\,cm^3$

Starter

1) Calculate $\frac{1}{5} - \frac{1}{7}$ $= \frac{7}{35} - \frac{5}{35} = \frac{2}{35}$

2) Multiply out the brackets: 5(3 - m) $15 - 5m$

3) Solve the equation: 2a = 5 - a

$+a$ $+a$

$3a = 5$

$a = \frac{5}{3}$

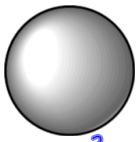
4) Simplify: 4a + 2b - 3 + a - 5b

$5a - 3b - 3$

Today's Learning:

To find the volume of a pyramid.

The volume of this sphere is 4189 cm^3.
Calculate the radius of this sphere.



$4189 = \frac{4}{3} \times \pi \times r^3$

$4189 = 4.1888 \times r^3$

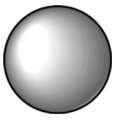
$\div 4.1888$ $\div 4.1888$

$1000 = r^3$

$\sqrt[3]{1000} = r$

$10 = r$

$10cm$



Volume = 2500 m^3

$V = \frac{4}{3}\pi r^3$

$2500 = \frac{4}{3}\pi r^3$

$2500 = 4.1888 \times r^3$

$\div 4.1888$ $\div 4.1888$

$596.8 = r^3$

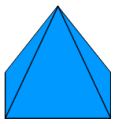
$\sqrt[3]{596.8} = r$

$8.42 = r$

$8.42m$

$\times 2$

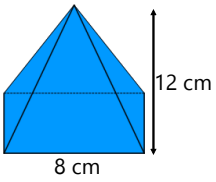
$16.8m$



Volume of a Pyramid 9/6/17

$V = \frac{1}{3}$ x base area x perpendicular height

e.g. 1) Find the volume of this square based pyramid.



$A = L \times B$
$= 8 \times 8$
$= 64\ cm^2$

$V = \frac{1}{3} Ah$
$= \frac{1}{3} \times 64 \times 12$
$= 256\ cm^3$

Starter

1) Multiply out the brackets: $-3(2 - m)$
$= -6 + 3m$

2) Round to 4 significant figures: 3.41569
$= 3.416$

3) Simplify the following: 2 x a + 3 x b - a - b
$= 2a + 3b - a - b$
$= a + 2b$

4) Evaluate: $\frac{4}{6} - \frac{2}{3}$
$= \frac{4}{6} - \frac{4}{6} = 0$

5) Without a calculator, calculate 2 x 0.75 + 1.3 - 2 x 0.45
$= 1.5 + 1.3 - 0.9$
$= 2.8 - 0.9$
$= 1.9$