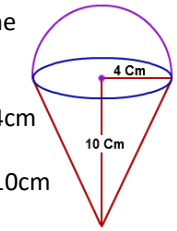
Final Countdown Higher Revision Mat

1) Calculate the volume.

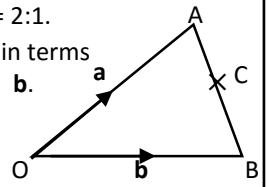
Radius of cone 4cm

Height of cone 10cm



2) The point C on AB such that AC : CB = 2:1.

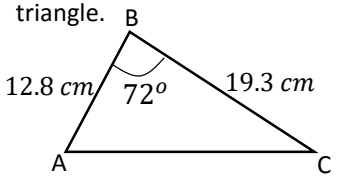
Find $\overrightarrow{OC}$ in terms of **a** and **b**.



3) Make m the subject of the formula.

$$\frac{m}{l+m}=\frac{n}{p}$$

4) Calculate the area of the triangle.



5) Millie travelled 190 miles to the nearest ten miles to London at an average speed of 67.4 mph correct to 3 significant figures. What was the quickest time possible for her to complete her journey?

6) By eliminating y, find the solutions to the simultaneous equations

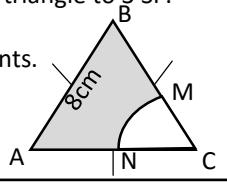
$$x^2+y^2=25$$
$$y=x-7$$

7) Expand and simplify

$$(\sqrt{5}-\sqrt{7})(\sqrt{5}+3)$$

8) Calculate the area of the shaded region inside the equilateral triangle to 3 SF.

M & N are midpoints.



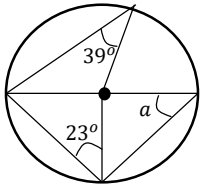
9) y is directly proportional to x^2.

$y=300$ when $x=5$.

Calculate the value of y when $x=9$

10) Express $\mathbf{0.3\dot{5}4\dot{7}}$ as a fraction in it's simplest form.

11) Calculate the size of angle a.



12) A school inspector takes a stratified sample of 60 students. How many students in year 8 are in the sample?

Year 7	Year 8	Year 9
176	188	86

13) Write $\frac{\sqrt{8}+6}{\sqrt{2}}$ in the form $p+q\sqrt{2}$, where p and q are integers.

14) Solve $12x^2-10x-5=0$

15) Evaluate

$$125^{\frac{2}{3}}$$

16) Work out

$$(3.7\times10^6)\times(4.8\times10^7)$$

17) Rationalise

$$\frac{\sqrt{3}+4}{\sqrt{2}-5}$$

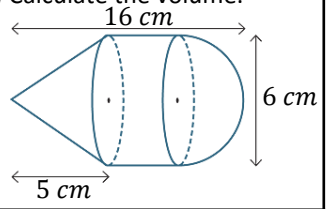
18) s is inversely proportional to t.

$s=8$ when $t=2$

Calculate the value of s when $t=4$.

19) Prove using algebra the sum of four consecutive numbers is always even.

20) Calculate the volume.



Challenge

There are 'n' students in a class. 6 of the students are girls. Miss B selects a students name at random to go on a trip out of a hat and places the name to one side. Miss B then selects another student at random for the names in the hat. The probability Miss B selects two girls is $\frac{2}{5}$.

Show that $n^2-n-75=0$