

MATHSDIY

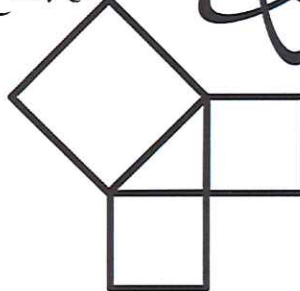
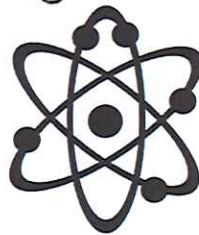
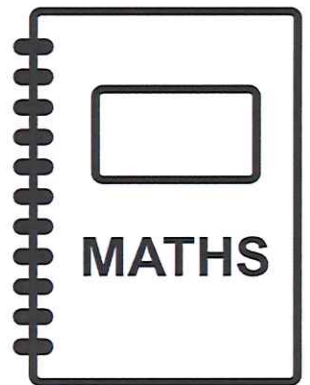
SOLUTIONS

GCSE TOPIC BOOKLET ESTIMATION

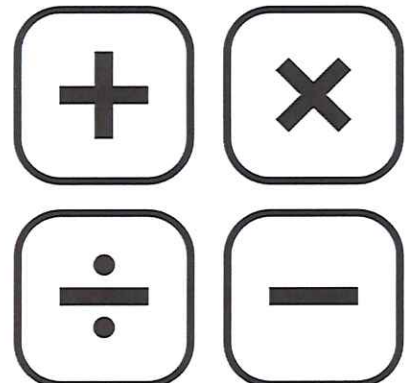
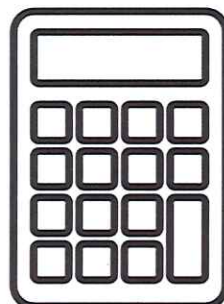
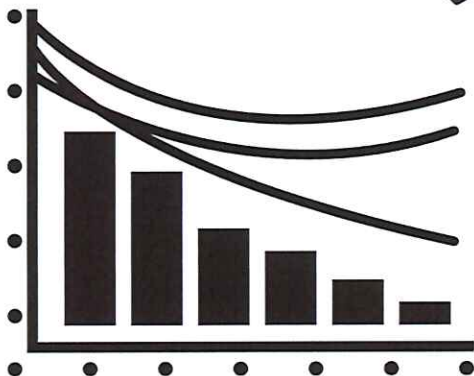
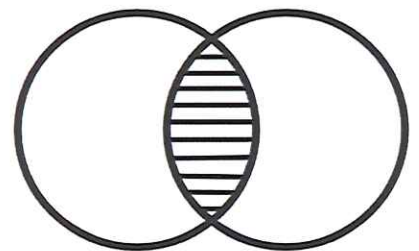
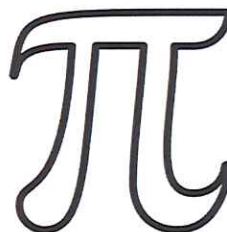
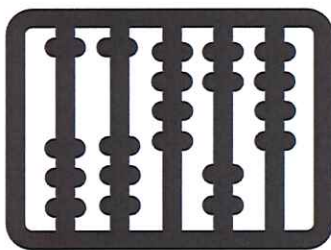
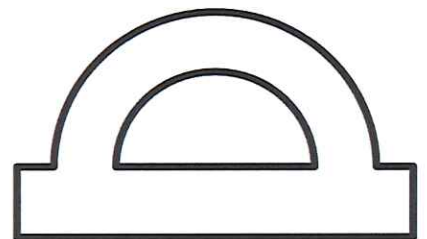
TIP:- When estimating in general round all of the numbers to **one significant figure**.

But in question ③ rounding 319 to 320 instead of 300 makes the question much easier to do (and actually more accurate).

Sometimes you need to use common sense.



$$a^2 = b^2 + c^2$$



DO NOT USE A CALCULATOR WHEN ANSWERING THESE QUESTIONS

1. Showing your working find an ESTIMATE for 198×12 .

$$\approx 200 \times 10$$

$$= \underline{2000}$$

(2)

2. Clearly showing how you obtained your answer, ESTIMATE the value of:

$$\frac{48 \times 1577}{210}$$

$$\approx \frac{50 \times 2000}{200}$$

$$= \frac{1000}{2} = \underline{500}$$

(2)

3. Show clearly how you would obtain an ESTIMATE for the following calculation.

$$\frac{96 \times 319}{82}$$

$$\approx \frac{100 \times 300}{80}$$

$$= \frac{3000}{8} \leftarrow \text{a bit tricky}$$

but easier if do

$$\approx \frac{100 \times 320}{80}$$

using 320 instead of 300 makes this one much easier.

$$= \frac{3200}{8} = \underline{400} \quad (2)$$

4. **ESTIMATE** the value of:

$$\frac{58 \times 92}{487}$$

$$\approx \frac{60 \times 90}{500}$$

$$= \frac{54}{5} = \frac{108}{10}$$

$$= \underline{\underline{10.8}}$$

I've used an equivalent fraction that makes it easy.

Show clearly how you obtain your answer.

(2)

5. **ESTIMATE** the value of:

$$\frac{(4.768)^3 \times 0.42}{18.6 \times 0.037}$$

$$\approx \frac{5^3 \times 0.4}{20 \times 0.04}$$

$$= \frac{125 \times \cancel{0.04} \times 10}{20 \times \cancel{0.04}}$$

$$= \frac{125}{2} = \underline{\underline{62.5}}$$

Show clearly how you obtain your answer.

(3)

6. **ESTIMATE** the value of:

$$\frac{597 \times \sqrt{35.7}}{9.2}$$

estimate this as a square number

$$\approx \frac{600 \times \sqrt{36}}{9}$$

$$= \frac{600 \times 6}{9}$$

$$= \frac{3600}{9} \quad \begin{array}{r} 400 \\ 9 \overline{) 3600} \end{array}$$

$$= \underline{\underline{400}}$$

Show clearly how you obtain your answer.

(3)

7. Show clearly how you would obtain an **ESTIMATE** for the following calculation.

$$\frac{594.3 \times 7.6}{38.7}$$

$$\approx \frac{600 \times 8}{40}$$

$$= \frac{4800}{40}$$

$$= 4 \overline{)120} = 120$$

(2)

8. a) Showing all your working, find an **ESTIMATE** for the value of 9.1×29.8 .

$$\approx 9 \times 30 = 270$$

(2)

- b) **ESTIMATE** the answer to 51×3.9 .

$$\approx 50 \times 4 = 200$$

(2)

- c) Showing all your working, find an **ESTIMATE** for the value of $4012 \div 49$.

$$\approx 4000 \div 50$$

$$= 400 \div 5 = 80$$

(2)

- d) Find an **ESTIMATE** for the value of 42.2×11.3 . Show all of your working.

$$\approx 40 \times 10 = \underline{400}$$

(2)

9. Show that $7.02^2 - 3.9^2$ is **approximately** 33.

$$\begin{aligned} &\approx 7^2 - 4^2 \\ &= 49 - 16 \\ &= \underline{33} \end{aligned}$$

(2)

10. Showing all your working, find an **ESTIMATE** for the value of 5.17×9.8 .

$$\begin{aligned} &\approx 5 \times 10 \\ &= \underline{50} \end{aligned}$$

(2)

11. **ESTIMATE** the value of:

Make this the square root of a square
 $\frac{28.17 \times 0.48}{\sqrt{94.8}}$, giving your answer as a decimal.
 Show clearly how you obtain your answer.

$$\approx \frac{30 \times 0.5}{\sqrt{100}} = \frac{15}{10}$$

$$= \underline{1.5}$$

(3)

12. Obtain an **ESTIMATE** for

$$\frac{0.21^2 \times 319.76}{38.7 \times 0.0186}$$

$$\approx \frac{0.2^2 \times 300}{40 \times 0.02}$$

$$= \frac{0.04 \times 300}{0.8}$$

$$= \frac{12}{0.8} = \frac{120}{8}, 8 \overline{)120}^{15}$$

$$= \underline{\underline{15}}$$

(3)

13. Showing all your working, **estimate** the value of

$$\frac{2.09^3 \times \sqrt{98}}{0.196}$$

$$\approx \frac{2^3 \times \sqrt{100}}{0.2}$$

$$= \frac{8 \times 10}{0.2} = \frac{80}{0.2}$$

$$= \frac{800}{2} = \underline{\underline{400}}$$

(3)

14. Obtain an **ESTIMATE** of $\sqrt{24}$ to the nearest whole number

$$\approx \sqrt{25} = \underline{\underline{5}}$$

(1)