

TOPICS - NUMBER

Rounding and
Bounds

1

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Decimals

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Proportion and
Ratio

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Rounding and Bounds

1

Notes

A ball is thrown vertically upwards with a speed V metres per second.

The height, H metres, to which it rises is given by

$$H = \frac{V^2}{2g}$$

$V = 24.4$ correct to 3 significant figures.

$g = 9.8$ correct to 2 significant figures.

- (i) Write down the lower bound of g .

.....

- (ii) Write the upper bound of v .

iii) Hence or otherwise, calculate the upper bound of H .
Give your answer correct to 3 significant figures.

.....

(Total 4 marks)

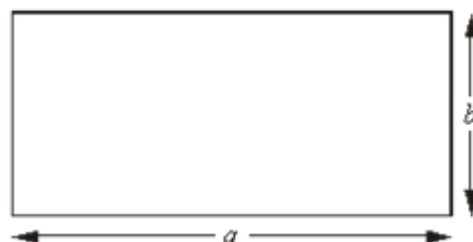
Katy drove for 238 miles, correct to the nearest mile.
She used 27.3 litres of petrol, to the nearest tenth of a litre.

Petrol consumption = $\frac{\text{Number of miles travelled}}{\text{Number of litres of petrol used}}$

Work out the upper bound for the petrol consumption for Katy's journey. Give your answer correct to 2 decimal places.

..... Miles per litre
(Total 3 marks)

Here is a rectangle.



$a = 8.3$ cm correct to 1 decimal place.

$b = 3.6$ cm correct to 1 decimal place.

- (a) Calculate the upper bound of the area of this rectangle.
Write down all the figures on your calculator.

..... cm²

(2)

Find the area of this rectangle correct to an appropriate number of significant figures.

..... cm²

(2)

(Total 4 marks)

Percentages

2

Notes

In a sale normal prices are reduced by 20%.
The sale price of an item was £220, what was
the normal price?

£.....
(Total 2 marks)

The value of a car depreciates by 35% each year.
At the end of 2007 the value of the car was £5460
Work out the value of the car at the end of 2006

£.....
(Total 3 marks)

Toby invested £4500 for 2 years in a savings account.
He was paid 4% per annum compound interest.
How much did Toby have in his savings account after 2
years?

£.....
(Total 3 marks)

Kylie wants to invest £20 000 for 3 years.
She considers two investments, Investment A and
Investment B.

Investment A	Investment B
£20 000	£20 000
Earns 3.02% interest per annum	Earns 2.98% compound interest per annum
Interest paid yearly by <u>cheque</u>	

Kylie wants to get the greatest return on her investment.
Which of these investments should she choose?

.....
(Total 6 marks)

Indices and Surds

3

Notes

1. Work out the values of the expressions

$$8^{-1}$$

$$7^0$$

$$5^3$$

$$(-2)^2$$

$$\left(\frac{2}{5}\right)^3$$

$$\left(\frac{2}{5}\right)^{-3}$$

$$25^{\frac{1}{2}}$$

2. Write the numbers in standard form

$$600$$

$$0.00132$$

$$80\,500$$

3. Write these as ordinary numbers

$$3.96 \times 10^4$$

$$8.02423 \times 10^3$$

$$4.12 \times 10^{-4}$$

4. Calculate

$$a^2 \times a^5$$

$$(3a^4)^2$$

$$3a^2 \times (2a)^4$$

$$24a^7 \div 6a^3$$

5.. Expand and Simplify

$$(2 + \sqrt{3})(1 + \sqrt{3})$$

$$(2 - \sqrt{5})(7 + 2\sqrt{5})$$

6.. Rationalise the denominator

$$\frac{1}{\sqrt{3}}$$

$$\frac{2}{\sqrt{5}}$$

Fractions and Decimals

4

Notes

Write the number $0.\dot{4}$ as a fraction

£.....
(Total 2 marks)

Prove that the recurring decimal.

$$0.\dot{1}\dot{7} = \frac{17}{99}$$

(Total 2 marks)

Change the recurring decimal $0.\dot{2}\dot{3}$ to a fraction.

.....
(Total 2 marks)

A company sends every item of mail by second class post. Each item of mail is either a letter or a packet.

Letter

Weight range	Second Class
0–100g	32p

Packet

Weight range	Second Class
0–100g	£1.17
101–250g	£1.51
251–500g	£1.95
501–750g	£2.36
751–1000g	£2.84

The company sent 420 items by second class post.
The ratio of the number of letters sent to the number of packets sent was 5 : 2.

$\frac{2}{3}$ were in the weight range 0 – 100 g.

The others were in the weight range 101 – 250 g.

Work out the total cost of sending the 420 items by second class post.

£

(Total 5 marks)

Proportion and Ratio

5

Notes

Julie buys 19 identical calculators.
The total cost is £143.64

Work out the total cost of 31 of these calculators.

£

(Total 3 marks)

A is inversely proportional to B
When $a=10$, $b=32$

What will $b=$ when $a=40$

£.....

(Total 2 marks)

D is proportional to S^2

$D = 900$ when $S = 20$

Calculate the value of D when $S = 25$

$D =$

(Total 4 marks)

q is inversely proportional to the square of t .

When $t = 4$, $q = 8.5$

(a) Find a formula for q in terms of t .

$q =$

(3)

(b) Calculate the value of q when $t = 5$

.....

(1)

(Total 4 marks)

P is inversely proportional to d^2

$P = 10\,000$ when $d = 0.4$.

Find the value of P when $d = 0.8$.

$P =$

(Total 3 marks)