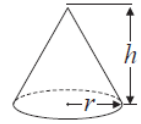


- 1 A cone has a volume of  $98 \text{ cm}^3$ .  
The radius of the cone is  $5.13 \text{ cm}$ .

(a) Work out an estimate for the height of the cone.

$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$



.....cm

(3)

John uses a calculator to work out the height of the cone to 2 decimal places.

- (b) Will your estimate be more than John's answer or less than John's answer?  
Give reasons for your answer.

.....

.....

.....

(1)

- 2 A train travelled along a track in 110 minutes, correct to the nearest 5 minutes.

Jake finds out that the track is 270 km long.

He assumes that the track has been measured correct to the nearest 10 km.

- (a) Could the average speed of the train have been greater than 160 km/h?  
You must show how you get your answer.

(4)

Jake's assumption was wrong.

The track was measured correct to the nearest 5 km.

- (b) Explain how this could affect your decision in part (a).

.....

.....

.....

(1)

3 A cycle race across America is 3069.25 miles in length.

Juan knows his average speed for his previous races is 15.12 miles per hour.  
For the next race across America he will cycle for 8 hours per day.

(a) Estimate how many days Juan will take to complete the race.

.....  
(3)

Juan trains for the race.  
The average speed he can cycle at increases.  
It is now 16.27 miles per hour.

(b) How does this affect your answer to part (a)?

.....  
.....  
(1)

4 A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

..... seconds  
(3)

(b) Is your answer to part (a) an underestimate or an overestimate?  
Give a reason for your answer.

.....  
.....  
(1)

- 5 (a) Work out an estimate for the value of  $\sqrt{63.5 \times 101.7}$

.....  
(2)

$(2.3)^6 = 148$  correct to 3 significant figures.

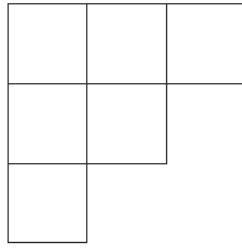
- (b) Find the value of  $(0.23)^6$  correct to 3 significant figures.

.....  
(1)

- (c) Find the value of  $5^{-2}$

.....  
(1)

- 6 The diagram shows a shape made from 6 identical squares.



The total area of the shape is  $5406 \text{ cm}^2$

- (a) Find an estimate for the length of one side of each square.  
Give your answer correct to the nearest whole number.

..... cm  
(3)

- (b) Is your answer to part (a) an underestimate or an overestimate?  
You must give a reason for your answer.

.....  
.....  
.....  
(1)