

## Error intervals

### Starter

1. **(Review of last lesson)** The petrol consumption of a car is 14.8 miles per litre and petrol costs £1.29 per litre. Jasper **estimates** that the petrol costs of a round trip of about 4531 miles will be £400. Is this a reasonable estimate? Show your working.

**Working:** Cost of round trip =  $\frac{4531}{14.8} \times 1.29 \approx \frac{4500}{15} \times 1.30 = 300 \times 1.30 = 390$   
 Yes, £400 is a reasonable estimate.

2. Write down (i) the lowest number and (ii) the highest number that rounds to:  
 (a) 360 (nearest 10)      (b) 36 (nearest integer)      (c) 36.4 (1 d.p.)

**Working:**

(a) 360 (nearest 10)	(i) Lowest = 355
	(ii) Highest = 364.9
(b) 36 (nearest integer)	(i) Lowest = 35.5
	(ii) Highest = 36.49
(c) 36.4 (1 dp)	(i) Lowest = 36.35
	(ii) Highest = 36.449

**E.g. 1** Write down the error intervals of:

- (a) 18 (rounded to the nearest integer)  
 (b) 8300 (rounded to the nearest 100)  
 (c) 9.36 (rounded to 2 d.p.)  
 (d) 70 (rounded to 1 s.f.)

**Working:**

(a) 18 (rounded to the nearest integer)  
 Next integer down is 17, next integer up is 19.  
 The error interval is  $17.5 \leq x < 18.5$

(b) 8300 (rounded to the nearest 100)  
 "Rounded to the nearest 100" so half a unit is 50  
 The error interval is  $8250 \leq x < 8350$

(c) 9.36 (rounded to 2 d.p.)  
 Next number rounded to 2 d.p. down is 9.35  
 Next number rounded to 2 d.p. up is 9.37  
 The error interval is  $9.355 \leq x < 9.365$

(d) 70 (rounded to 1 s.f.)  
 Next number rounded to 1 s.f. down is 60  
 Next number rounded to 1 s.f. up is 80  
 The error interval is  $65 \leq x < 75$

**E.g. 2** Truncate these numbers to the required degree of accuracy:

- (a) 7.3198 to 2 d.p.      (b) 893526 to 1 s.f.

**Working:**

(a) 7.3198 truncated to 2 d.p. is 7.31  
 (b) 893526 truncated to 1 s.f. is 800000

