

## Parallel and Intersecting Lines

### Starter

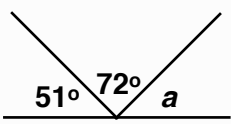
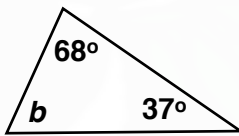
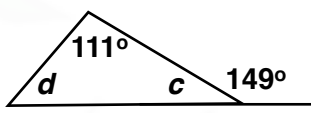
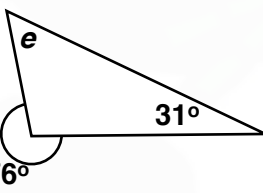
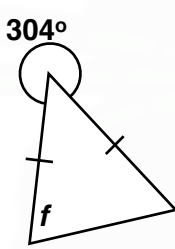
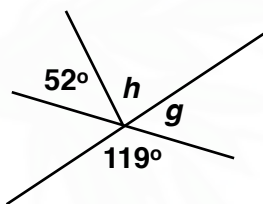
1. **(Review of last lesson)** The total mass of 5 rugby players is 425 kg and the mean of ten ballet dancers is 40 kg. What is the average mass of all 15 people?

**Working:** The mass of the 10 ballet dancers =  $10 \times 40 = 400$  kg  
 Total mass of the 15 people =  $425 + 400 = 825$  kg  
 Average mass of all 15 people =  $\frac{825}{15} = 55$  kg

2. **(Review of Y7 material)** Copy and complete these statements:

- (a) Angles around a point add up to \_\_\_\_.  
 (b) Angles on a straight line add up to \_\_\_\_.  
 (c) Angles in a triangle add up to \_\_\_\_.  
 (d) Angles in a quadrilateral add up to \_\_\_\_.

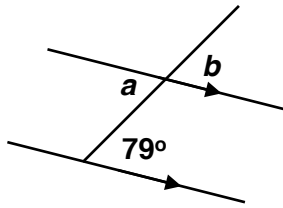
**Working:** (a) Angles around a point add up to  $360^\circ$   
 (b) Angles on a straight line add up to  $180^\circ$ .  
 (c) Angles in a triangle add up to  $180^\circ$ .  
 (d) Angles in a quadrilateral add up to  $360^\circ$ .

3. (a)  (b)  (c) 
- (d)  (e)  (f) 

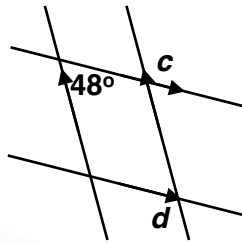
**Working:** (a)  $a = 180 - 72 - 52 = 57^\circ$   
 (b)  $b = 180 - 68 - 37 = 75^\circ$   
 (c)  $c = 180 - 149 = 31^\circ$   
 $d = 180 - 111 - 31 = 38^\circ$   
 (d) The unmarked angle in the triangle =  $360 - 276 = 84^\circ$   
 $e = 180 - 84 - 31 = 65^\circ$   
 (e) Since it is an isosceles triangle, the bottom right angle is also  $f$ .  
 The top angle =  $360 - 304 = 56^\circ$   
 $2f = 180 - 56 = 124^\circ$   
 $f = \frac{124}{2} = 62^\circ$   
 (f)  $g = 180 - 119 = 61^\circ$   
 $h = 180 - 61 - 52 = 67^\circ$

**E.g. 1** Find the marked angles, giving reasons for your answers.

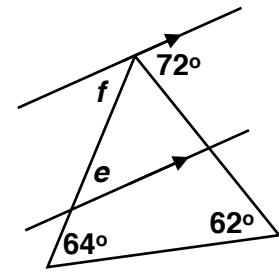
(a)



(b)



(c)



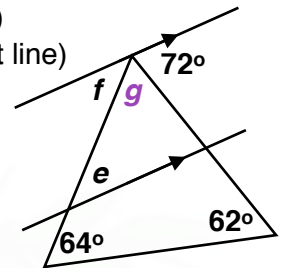
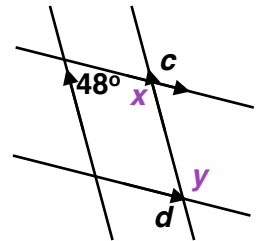
**Hint:** Add more letters to your diagram.

**Working:**

(a)  $a = 79^\circ$  (alternate angles)  
 $b = 79^\circ$  (vertically opposite angles)

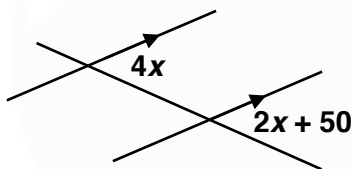
(b)  $x = 180 - 48 = 132^\circ$  (allied angles)  
 $c = x = 132^\circ$  (vertically opposite angles)  
 $y = x = 132^\circ$  (alternate angles)  
 $d = y = 132^\circ$  (vertically opposite angles)

(c)  $g = 180 - 64 - 62 = 54^\circ$  (angles in triangle)  
 $f = 180 - 72 - 54 = 54^\circ$  (angles on straight line)  
 $e = f = 54^\circ$  (alternate angles)

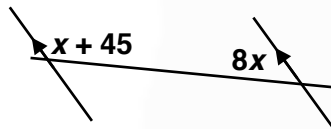


**E.g. 2** Calculate the value of  $x$ . Show your working clearly and give reasons.

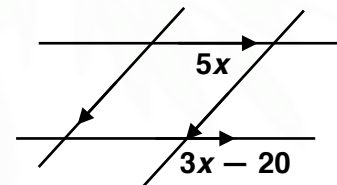
(a)



(b)



(c)

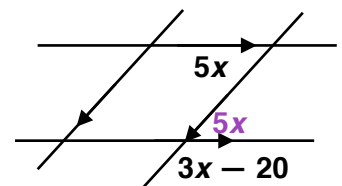


**Working:**

(a)  $4x = 2x + 50$  *corresponding angles*  
 $2x = 50$   
 $x = 25$

(b)  $x + 45 + 8x = 180$  *allied angles*  
 $9x + 45 = 180$   
 $9x = 135$   
 $x = 15$

(c) *Using alternate angles, another angle is marked as 5x.*  
 $5x + 3x - 20 = 180$   
*(angles on straight line add up to 180°)*  
 $8x - 20 = 180$   
 $8x = 200$   
 $x = 25^\circ$



Video: [Angles - parallel lines](#)  
Video: [Angles in triangles](#)

[Solutions to Starter and E.g.s](#)

**Exercise**

p195 Ex 11.2 Qu 1-9 (draw all diagrams - give an explanation for each step)

[Textbook answers \(only available during a lockdown\)](#)

