

- 1 a** Yes (satisfies triangle inequality)  
**b** Yes (satisfies triangle inequality)  
**c** Yes (satisfies triangle inequality)  
**d** No (does not satisfy triangle inequality)
- 2 a** Scalene  
**b** Isosceles  
**c** Equilateral
- 3** Must be greater than 10 cm
- 4 a** 6, 6.5, 7  
**b** No
- 5** If  $2n - 1 = n + 7$  Then  $n = 8$  and the values are 15, 15, 15  
If  $2n - 1 = 3n - 9$  then  $n = 8$  and the sides are 15, 15, 15  
If  $3n - 9 = n + 7$  then  $n = 8$  and the values are 15, 15, 15
- 6 a**  $\theta = 46^\circ$ , straight angle;  
 $\beta = 70^\circ$ , complementary to  $\angle EBC$ ;  
 $\gamma = 64^\circ$ , alternate angles ( $\angle CBD$ );  
 $\alpha = 46^\circ$ , corresponding angles ( $\angle EBD$ )
- b**  $\gamma = 80^\circ$ , angle sum of triangle;  
 $\beta = 80^\circ$ , vertically opposite ( $\gamma$ );  
 $\theta = 100^\circ$ , supplementary to  $\beta$ ;  
 $\alpha = 40^\circ$ , alternate angles ( $\angle BAD$ )
- c**  $\alpha = 130^\circ$ , supplementary to  $\angle ADC$ ;  
 $\beta = 65^\circ$ , co-interior angles  $\angle CDA$ ;  
 $\gamma = 65^\circ$ , co-interior angles  $\angle ACD$
- d**  $\alpha = 60^\circ$ , equilateral triangle
- e**  $\alpha = 60^\circ$ , straight angle;  
 $\beta = 60^\circ$ , angle sum of triangle
- f**  $a = 55^\circ$ , straight angle;  
 $b = 55^\circ$ , corresponding angles ( $a$ );  
 $g = 45^\circ$ , vertically opposite;  
 $c = 80^\circ$ , angle sum of triangle;  
 $e = 100^\circ$ , straight angle;  
 $f = 80^\circ$ , corresponding angles ( $c$ )
- g**  $m = 68^\circ$ , corresponding angles;  
 $n = 60^\circ$ , angle sum of triangle;  
 $p = 52^\circ$ , straight angle;  
 $q = 60^\circ$ , alternate angles ( $n$ );  
 $r = 68^\circ$ , alternate angles ( $m$ )

**7 a** Sum =  $720^\circ$ ; Angles =  $120^\circ$

**b** Sum =  $1800^\circ$ ; Angles =  $150^\circ$

**c** Sum =  $3240^\circ$ ; Angles =  $162^\circ$

**8 a** Together they form 10 straight angles

**b**  $360^\circ$

**9** The exterior angles plus the interior angles add to  $n \times 180^\circ$

The interior angles sum to  $(n - 2)180^\circ$

Therefore the sum of the exterior angles is  $360^\circ$

**10**  $(n - 2)180 = 4 \times 360$

$$n - 2 = 8$$

$$n = 10$$

**11**  $(n - 2)180^\circ = k360^\circ$

$$\therefore 180n - 360 = 360k$$

Solving for  $n$

$$n = 2(k + 1)$$