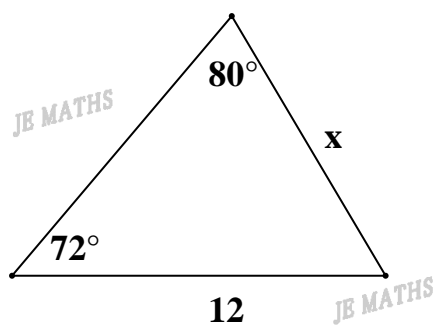


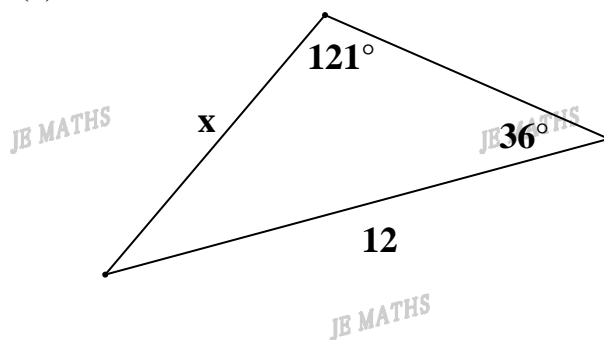
**Foundation stage 1:**

1. Use the sine rule to find  $x$  in the following triangle, correct to one decimal place.

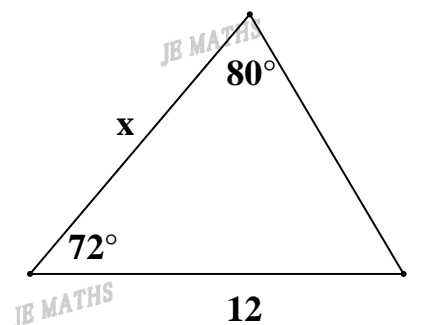
(a)



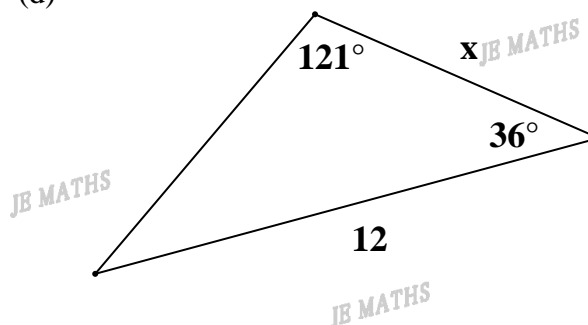
(b)



(c)

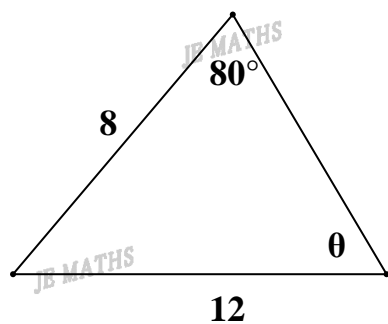


(d)

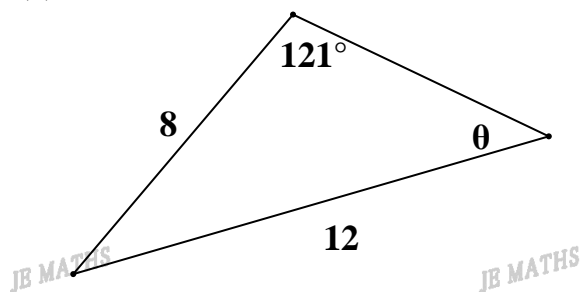


2. Use the sine rule to find  $\theta$  in the following triangle, correct to the nearest degree.

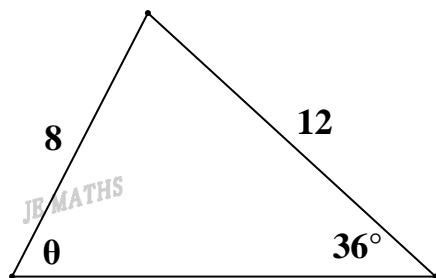
(a)



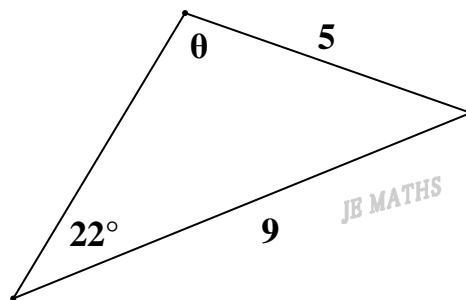
(b)



(c)

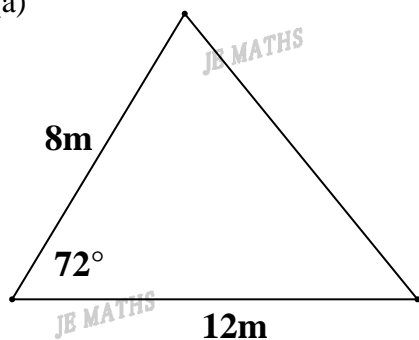


(d)

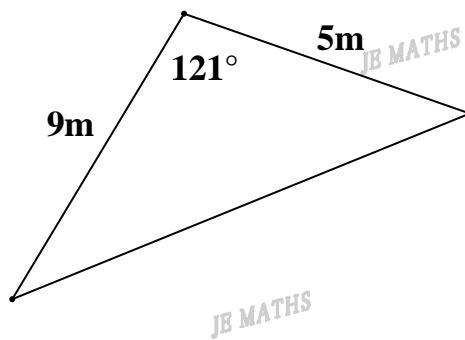


3. Find the area of the following triangle, correct to two decimal places:

(a)

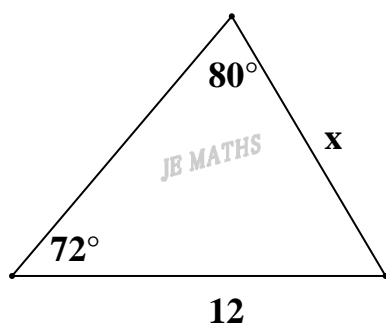


(b)

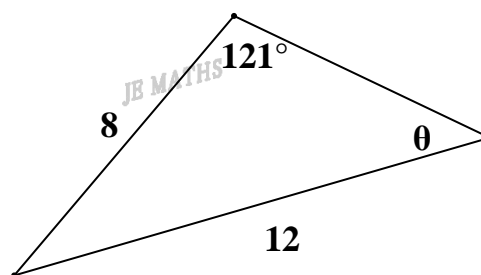


4. Find the area of the following triangle by using sine rule only, correct to the nearest  $\text{m}^2$ .

(a)



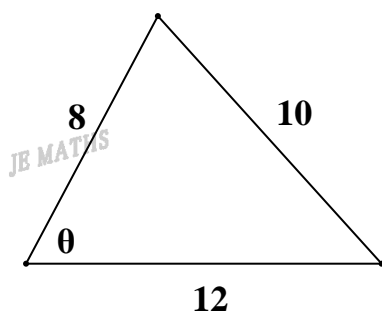
(b)



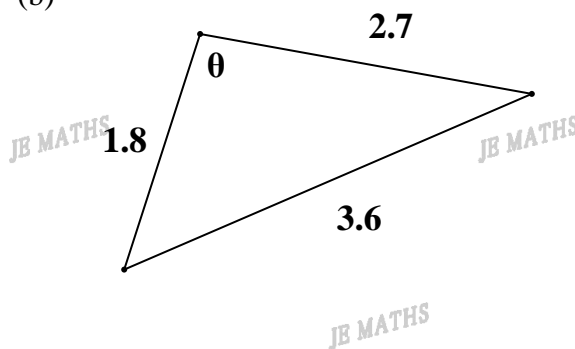
**Foundation stage 2:**

1. Use the cosine rule to find  $\theta$  in the following triangle, correct to the nearest minutes.

(a)

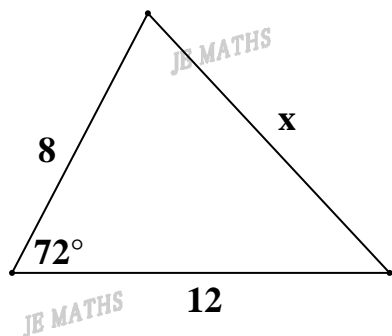


(b)

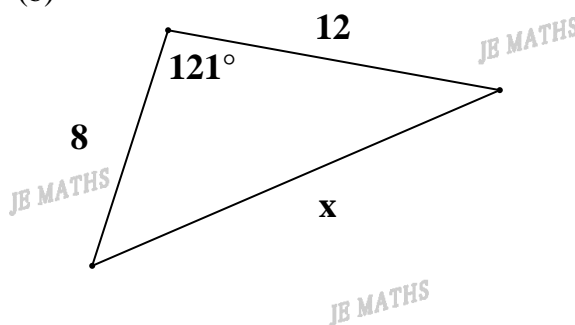


2. Use the cosine rule to find  $x$  in the following triangle, correct to one decimal place.

(a)

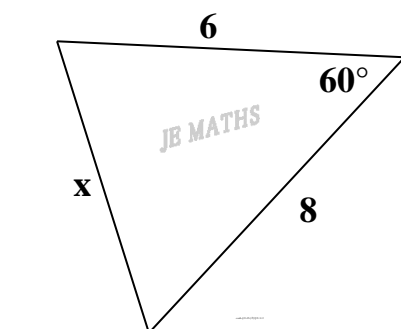


(b)

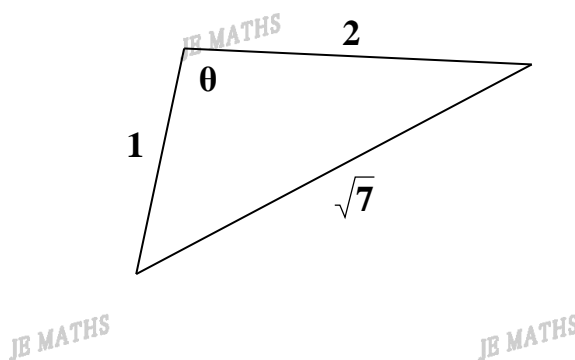


3. Find the exact value of the unknowns involving special trig ratios:

(a)



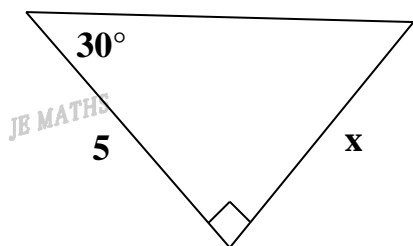
(b)



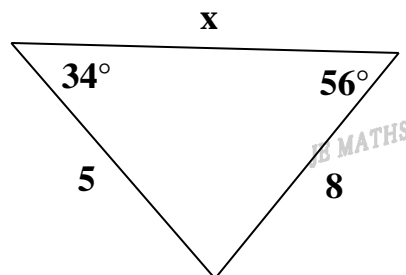
**Foundation stage 3:**

1. Find the **exact** value of the unknowns by using any method involving special trig ratios:

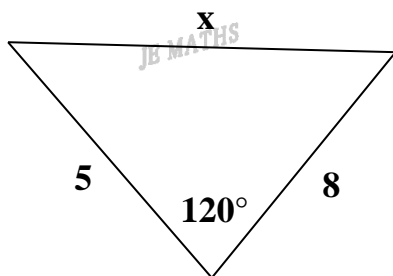
(a)



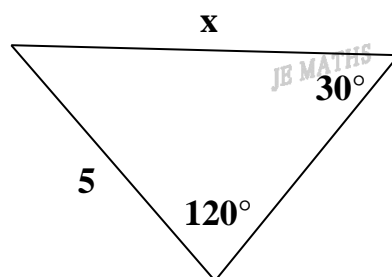
(b)



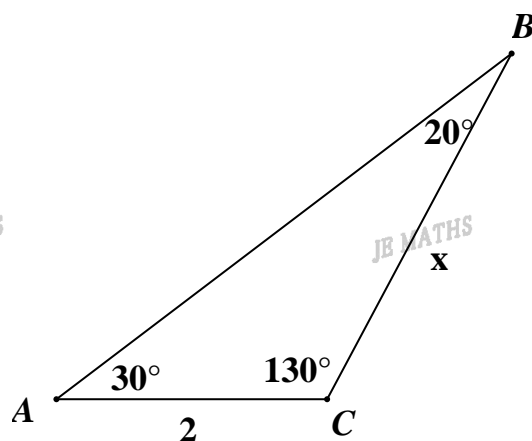
(c)



(d)



2. Given that the following triangle ABC, show that  $x = \frac{1}{\sin 20^\circ}$



**Foundation stage 1:**

1. (a)  
 $x/\sin 72^\circ = 12/\sin 80^\circ$   
 $x = 12\sin 72^\circ/\sin 80^\circ$   
 $x = 11.58\dots$   
 $x = 11.6$
- (b)  
 $x/\sin 36^\circ = 12/\sin 121^\circ$   
 $x = 12\sin 36^\circ/\sin 121^\circ$   
 $x = 8.22\dots$   
 $x = 8.2$
- (c)  
 $180^\circ - 72^\circ - 80^\circ = 28^\circ$   
 $x/\sin 28^\circ = 12/\sin 80^\circ$   
 $x = 12\sin 28^\circ/\sin 80^\circ$   
 $x = 5.72\dots$   
 $x = 5.7$
- (d)  
 $180^\circ - 121^\circ - 36^\circ = 23^\circ$   
 $x/\sin 23^\circ = 12/\sin 121^\circ$   
 $x = 12\sin 23^\circ/\sin 121^\circ$   
 $x = 5.47\dots$   
 $x = 5.5$
2. (a)  
 $\sin \theta/8 = \sin 80^\circ/12$   
 $\sin \theta = 8\sin 80^\circ/12$   
 $\sin \theta = 0.65\dots$   
 $\theta = 41^\circ, 139^\circ$  (omit)  
 $\theta = 41^\circ$
- (b)  
 $\sin \theta/8 = \sin 121^\circ/12$   
 $\sin \theta = 8\sin 121^\circ/12$   
 $\sin \theta = 0.57\dots$   
 $\theta = 35^\circ, 145^\circ$   
 $\theta = 35^\circ$
- (c)  
 $\sin \theta/12 = \sin 36^\circ/8$   
 $\sin \theta = 12\sin 36^\circ/8$   
 $\sin \theta = 0.88\dots$   
 $\theta = 62^\circ, 118^\circ$
- (d)  
 $\sin \theta/9 = \sin 22^\circ/5$   
 $\sin \theta = 9\sin 22^\circ/5$   
 $\sin \theta = 0.67\dots$   
 $\theta = 42^\circ, 138^\circ$
3. (a)  
 $A = 1/2 \times 8 \times 12 \times \sin 72^\circ = 65.65\text{m}^2$
- (b)  
 $A = 1/2 \times 9 \times 5 \times \sin 121^\circ = 19.29\text{m}^2$
4. (a)  
 $x/\sin 72^\circ = 12/\sin 80^\circ$   
 $x = 12\sin 72^\circ/\sin 80^\circ$   
 $x = 5.7$  (1dp)  
 $180^\circ - 72^\circ - 80^\circ = 28^\circ$   
 $A = 1/2 \times 12 \times 5.7 \times \sin 28^\circ$   
 $= 16\text{m}^2$  (0dp)
- (b)  
 $\sin \theta/8 = \sin 121^\circ/12$   
 $\sin \theta = 8\sin 121^\circ/12$   
 $\theta = 35^\circ$   
 $180^\circ - 121^\circ - 35^\circ = 24^\circ$   
 $A = 1/2 \times 8 \times 12 \times \sin 24^\circ$   
 $= 20\text{m}^2$  (0dp)

**Foundation stage 2:**

1. (a)

$$\cos \theta = (8^2 + 12^2 - 10^2) / (2 \times 8 \times 12)$$

$$\theta = 55^\circ 46'$$

(b)

$$\cos \theta = (1.8^2 + 2.7^2 - 3.6^2) / (2 \times 1.8 \times 2.7)$$

$$\theta = 104^\circ 29'$$

2. (a)

$$x^2 = 8^2 + 12^2 - 2 \times 8 \times 12 \times \cos 72^\circ$$

$$x = 12.2$$

(b)

$$x^2 = 8^2 + 12^2 - 2 \times 8 \times 12 \times \cos 121^\circ$$

$$x = 17.5$$

3. (a)

$$x^2 = 6^2 + 8^2 - 2 \times 6 \times 8 \times \cos 60^\circ$$

$$x^2 = 100 - 96 \times 0.5$$

$$x^2 = 52$$

$$x = \sqrt{52}$$

$$x = 2\sqrt{13}$$

(b)

$$\cos \theta = [1^2 + 2^2 - (\sqrt{7})^2] / (2 \times 1 \times 2)$$

$$\cos \theta = -2/4$$

$$\cos \theta = -1/2$$

$$\theta = 120^\circ$$

**Foundation stage 3:**

1. (a)

$$\tan 30^\circ = x/5$$

$$x = 5 \tan 30^\circ$$

$$x = 5\sqrt{3}/3$$

(c)

$$x^2 = 5^2 + 8^2 - 2 \times 5 \times 8 \times \cos 120^\circ$$

$$x = \sqrt{129}$$

(b)

$$180^\circ - 34^\circ - 56^\circ = 90^\circ$$

$$x = \sqrt{(5^2 + 8^2)} = \sqrt{89}$$

(d)

$$x/\sin 120^\circ = 5/\sin 30^\circ$$

$$x = 5 \sin 120^\circ / \sin 30^\circ$$

$$x = 5 \times \sqrt{3}/2 / (1/2)$$

$$x = 5\sqrt{3}$$

2.  $x/\sin 40^\circ = 2/\sin 20^\circ$ 

$$x = 2 \sin 30^\circ / \sin 20^\circ$$

$$x = 1/\sin 20^\circ$$