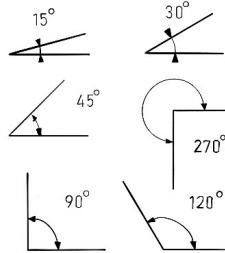


Chapter-3

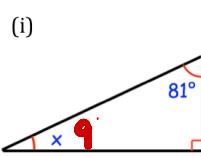
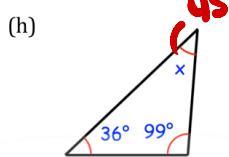
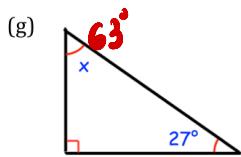
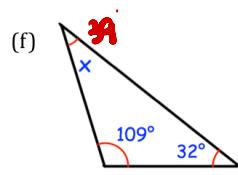
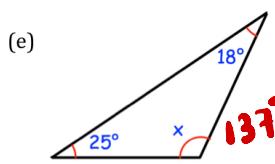
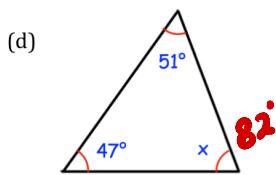
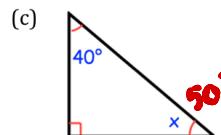
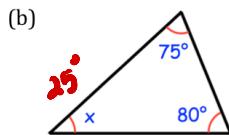
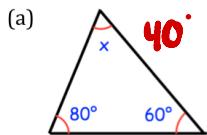
- . Angles
- . Parallel lines
- . Polygon
- . Construction

PARALLEL
PERPENDICULAR
INTERSECTING



Angles

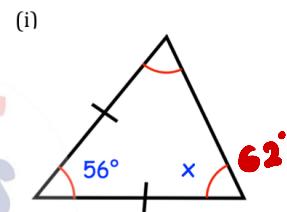
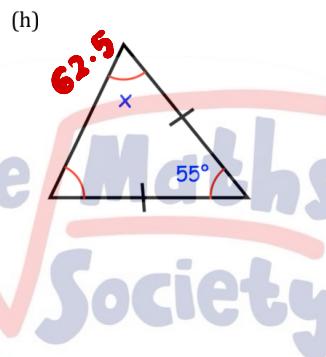
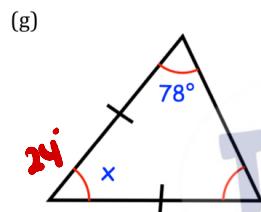
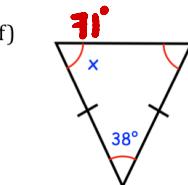
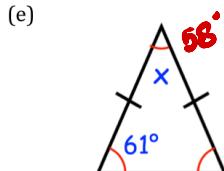
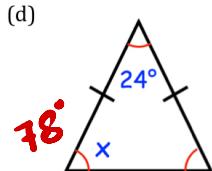
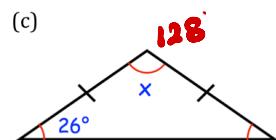
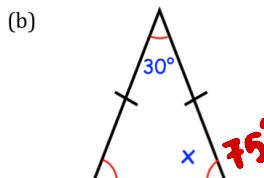
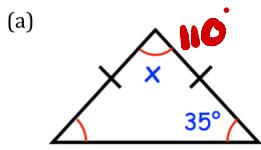
Question 1: Find the size of each missing angle.



Write your answers here :

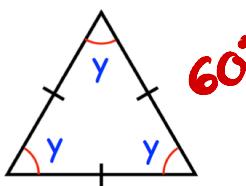
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Question 2: Find the size of each missing angle.



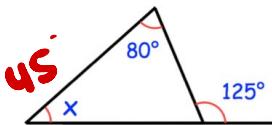
Write your answers here :

Question 3: Shown is an equilateral triangle.
Find the size y .

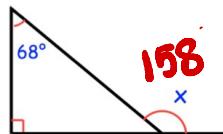


Question 4: Find the size of each missing angle.

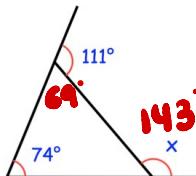
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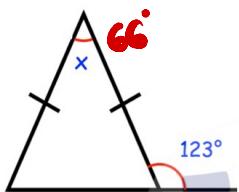
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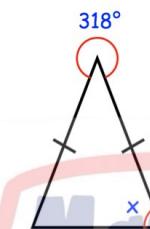
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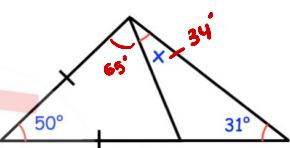
(d)



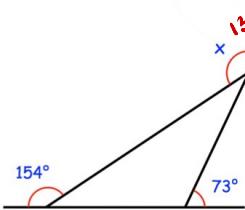
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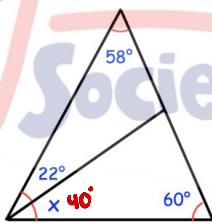
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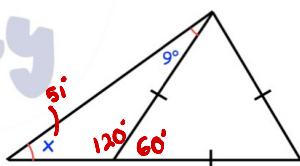
(g)



(h)



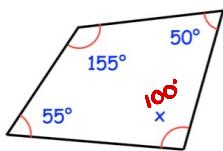
(i)



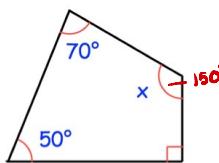
Write Your answer here:

Question 1: Find the size of each missing angle.

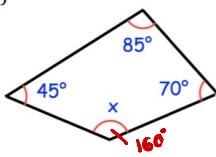
(a)



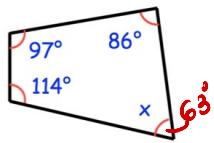
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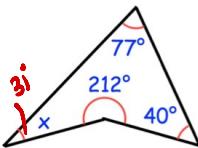
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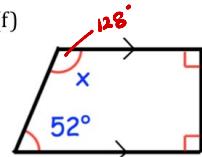
(d)



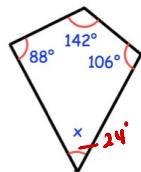
(e)



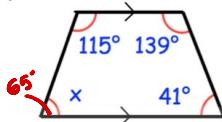
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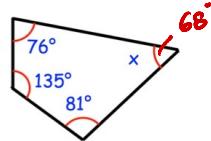
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(h)



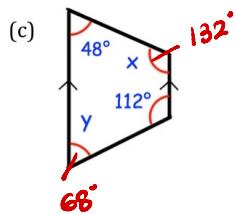
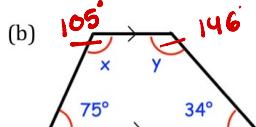
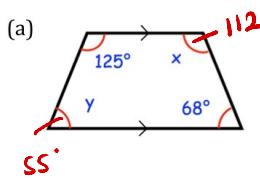
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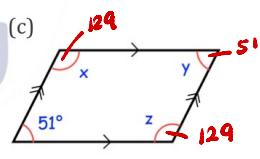
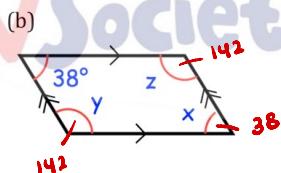
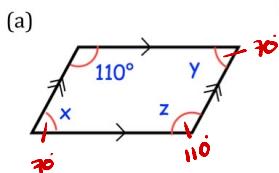
Write your answers here:

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Question 2: Shown below are three trapezia.
Find the size of each missing angle.

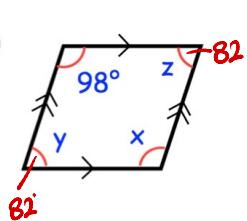


Question 3: Shown below are three parallelograms.
Find the size of each missing angle.

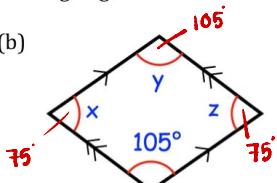


Question 4: Shown below are three rhombuses.
Find the size of each missing angle.

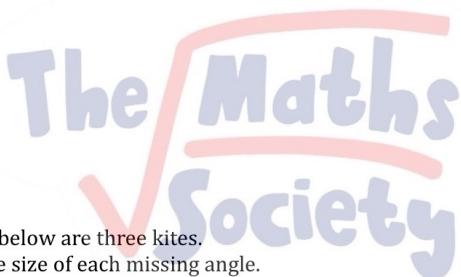
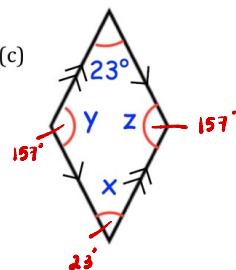
(a)



(b)

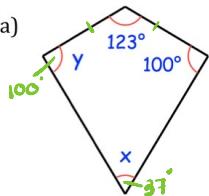


(c)

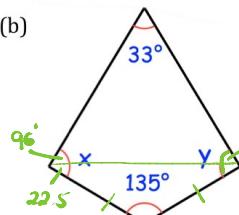


Question 5: Shown below are three kites.
Find the size of each missing angle.

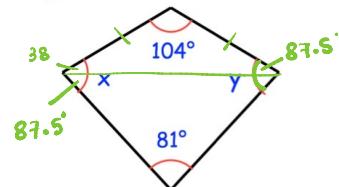
(a)



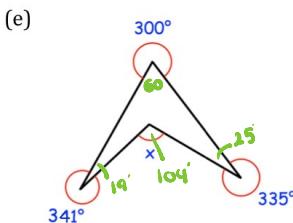
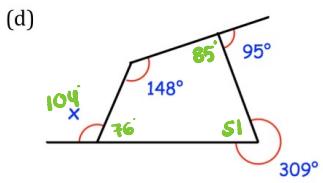
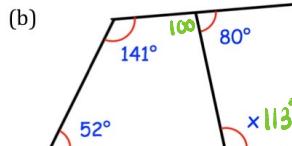
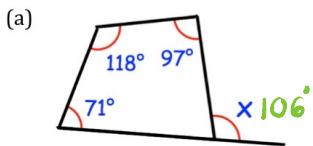
(b)



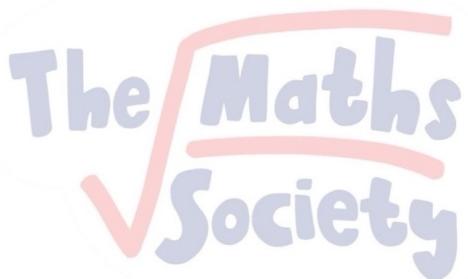
(c)



Question 6: Find the size of each missing angle.

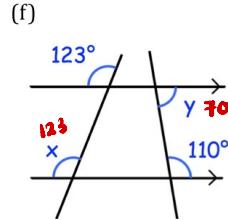
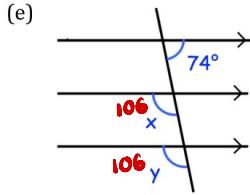
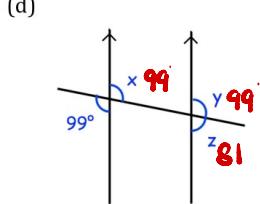
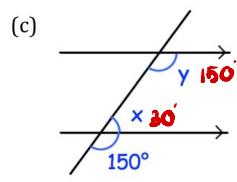
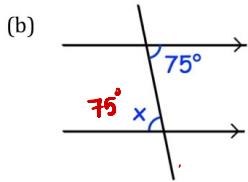
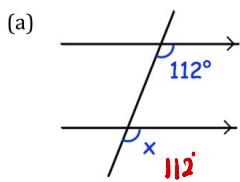


Write your answers here:

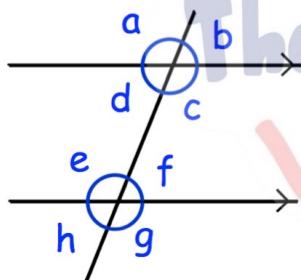


Parallel line

Question 1: Write down the sizes of the lettered angles.



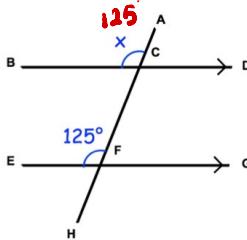
Question 2:



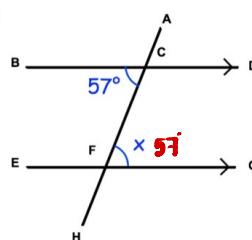
- (a) Which angle is corresponding to angle c? **g**
- (b) Which angle is alternate to angle d? **f**
- (c) Which angle is corresponding to angle h? **d**
- (d) Which angle is vertically opposite to angle a? **c**
- (e) Which angle is alternate to angle e? **c**
- (f) Which angle is co-interior with angle c? **f**
- (g) Which angle is vertically opposite to angle h? **f**
- (h) Which angle is co-interior with angle e? **d**
- (i) Which angle is corresponding to angle a? **e**
- (j) Which angle is vertically opposite to angle g? **e**

Question 3: Find the angle x in each question below.
Give reasons for your answer.

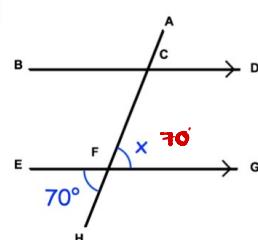
(a)



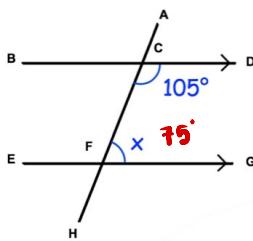
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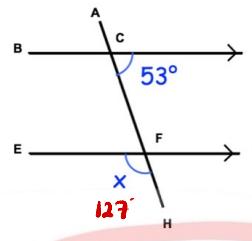
(c)



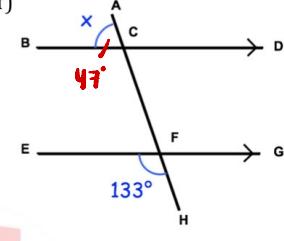
(d)



(e)

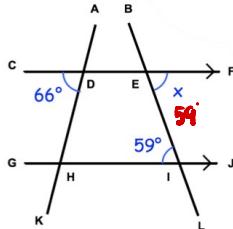


(f)

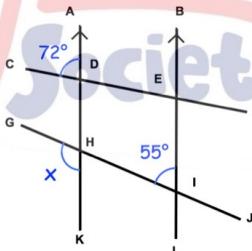


Question 4: Find the angle x in each question below.
Give reasons for your answer.

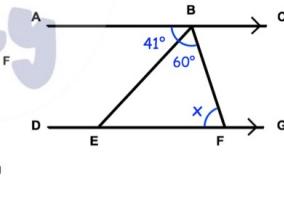
(a)



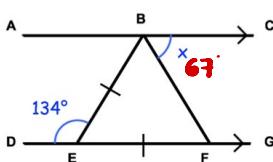
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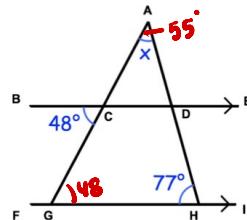
(c)



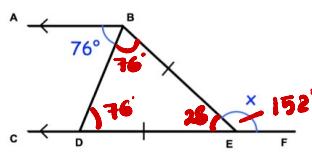
(d)



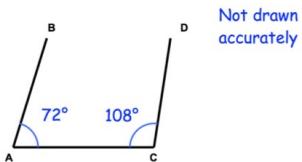
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(f)

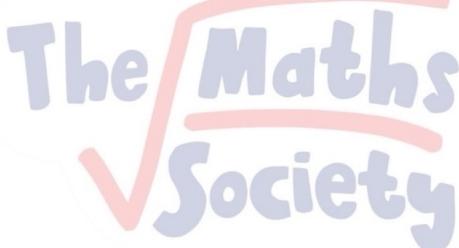
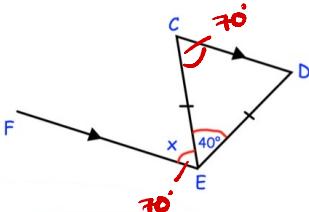


Question 1: Are the lines AB and CD parallel? Explain your answer.

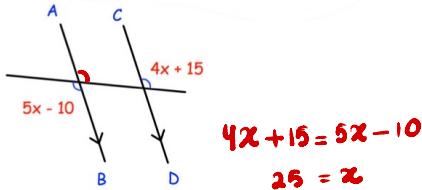


Yes, as $72 + 108 = 180^\circ$ so $AB \parallel CD$.

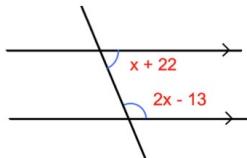
Question 2: Find the missing angle.
Give reasons for your answer.



Question 3: Find x



Question 4: Find x



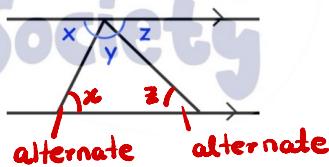
$$x + 22 + 2x - 13 = 180^\circ$$

$$3x + 9 = 180^\circ$$

$$3x = 171^\circ$$

$$x = 57^\circ$$

Question 5: Matilda is proving that the angles in a triangle add up to 180° .
She has started with this diagram.
Complete her proof.



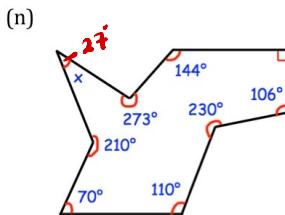
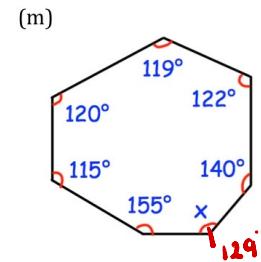
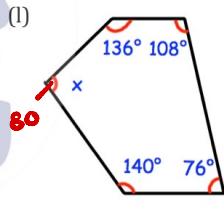
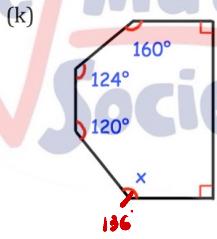
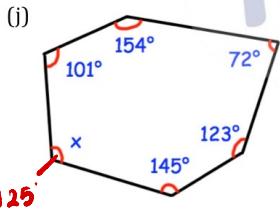
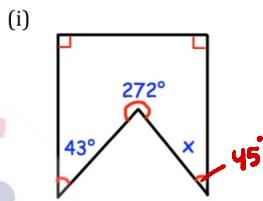
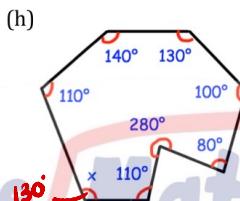
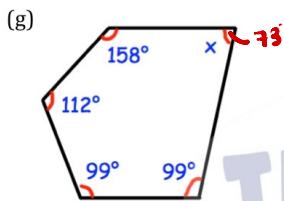
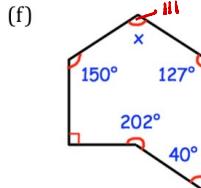
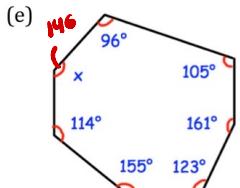
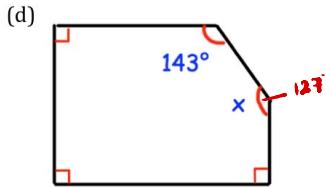
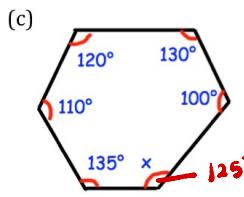
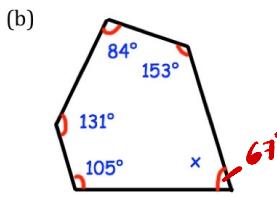
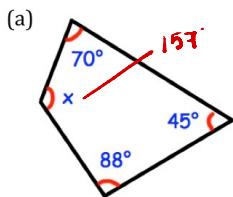
$$\therefore x + y + z = 180^\circ \quad (\text{as in a } \triangle \text{ adds up to } 180^\circ)$$

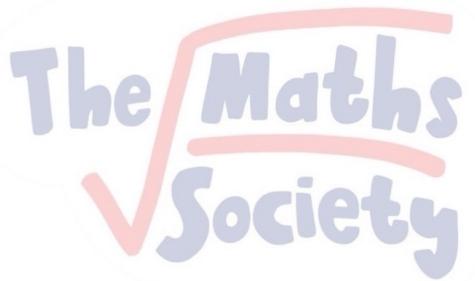
Polygon

Sum of interior $\angle s = (n-2) \times 180^\circ$

Sum of exterior $\angle s = 360^\circ$

Question 1: Find the missing angle in each irregular polygon





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$$(n-2) \times 180^\circ$$

Question 2: Work out the sum of the interior angles for polygons with

(a) 10 sides

(b) 14 sides

(c) 20 sides

(d) 45 sides

(e) 50 sides

(f) 80 sides

(g) 100 sides

(h) 200 sides

a. 1440

f. 14040

b. 2160

g. 17640

c. 3240

h. 35640

d. 7740

e. 8640

Question 3: Work out the number of sides of polygons with these sum of interior angles

(a) 1260°

(b) 2880°

(c) 3960°

(d) 5040°

(e) 12240°

(f) 15840°

(g) 2340°

(h) 89640°

a. $(n-2) \times 180^\circ = 1260$

f. $n=90$

n = 9

b. $(n-2) \times 180^\circ = 2880$

g. $n=15$

n = 18

h. $n=500$

c. $n=24$

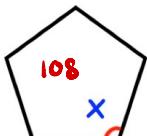
d. $n=30$

e. $n=70$

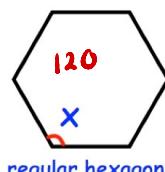
$$\frac{(n-2) \times 180^\circ}{n}$$

Question 4: Each of the polygons below are regular.
Calculate the size of each interior angle, x.

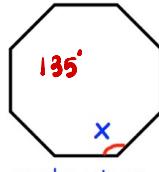
(a)



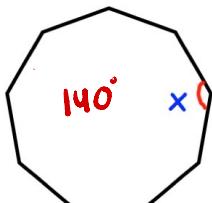
(b)



(c)

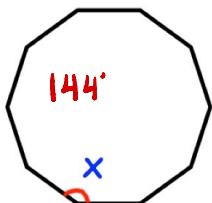


(d)



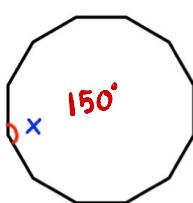
regular nonagon

(e)



regular decagon

(f)



regular dodecagon

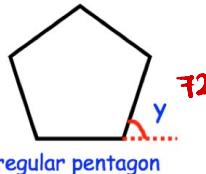
Question 5: Calculate the size of each interior angle in regular polygons with

- (a) 15 sides **156** (b) 20 sides **162** (c) 24 sides **165** (d) 30 sides **168**
 (e) 36 sides **170** (f) 40 sides **171** (g) 50 sides **172.8** (h) 60 sides **174**
 (i) 72 sides **175** (j) 80 sides **175.5** (k) 90 sides **176** (l) 100 sides **176.4**

Question 6: Each of the polygons below are regular.
Calculate the size of each exterior angle, y.

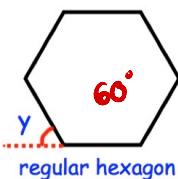
$$\frac{360}{n}$$

(a)



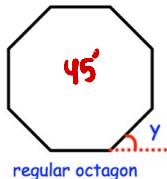
regular pentagon

(b)



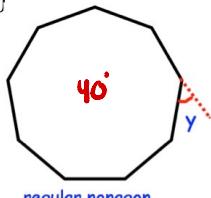
regular hexagon

(c)



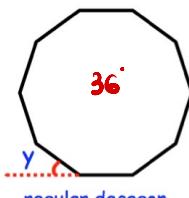
regular octagon

(d)



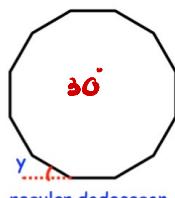
regular nonagon

(e)

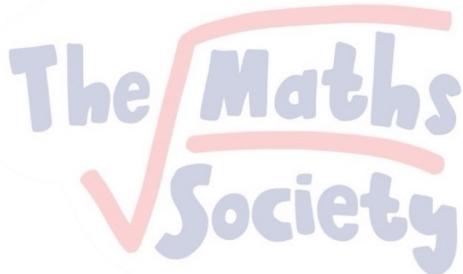


regular decagon

(f)



regular dodecagon



$$\frac{360}{n}$$

Question 7: Calculate the size of each exterior angle in regular polygons with

- (a) 15 sides **24** (b) 18 sides **20** (c) 20 sides **18** (d) 24 sides **15**
(e) 30 sides **12** (f) 36 sides **10** (g) 40 sides **9** (h) 45 sides **8**
(i) 60 sides **6** (j) 72 sides **5** (k) 90 sides **4** (l) 200 sides **1.8**

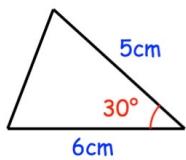
Question 8 Shown below is one interior angle from regular polygons.
Calculate how many sides the polygons have.

- (a)  144° **10**
(b)  175° **72**
(c)  178° **180**
(d)  177° **120**
(e)  168.75° **32**
(f)  172.5° **48**

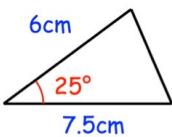
Construction

Question 1: Accurately draw the following triangles.

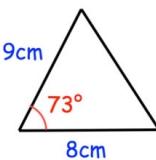
(a)



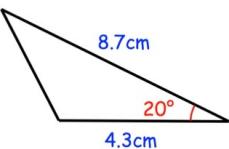
(b)



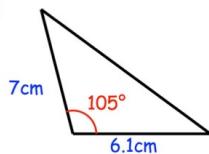
(c)



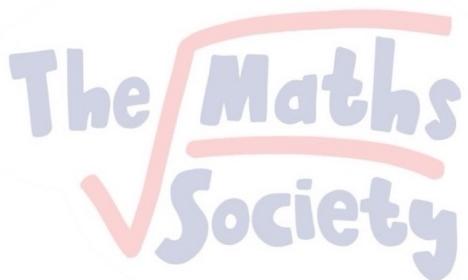
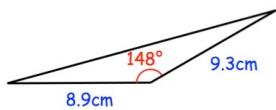
(d)

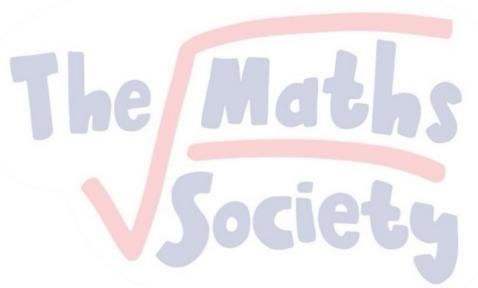


(e)

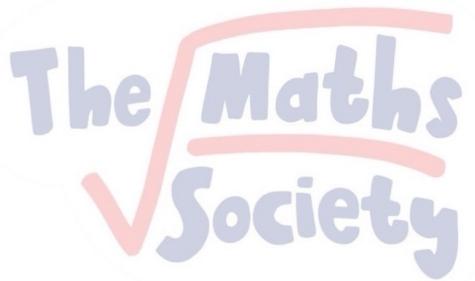


(f)





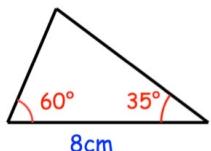
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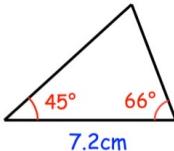
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Question 2: Accurately draw the following triangles.

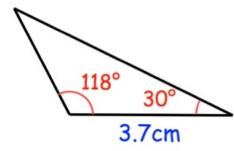
(a)



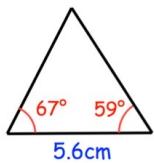
(b)



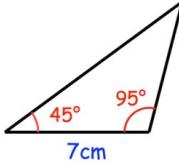
(c)



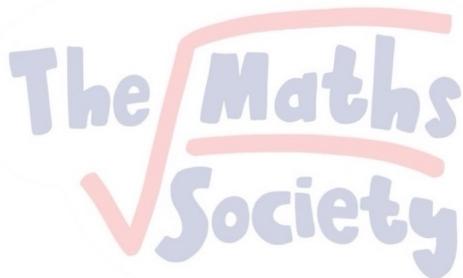
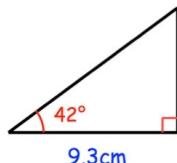
(d)

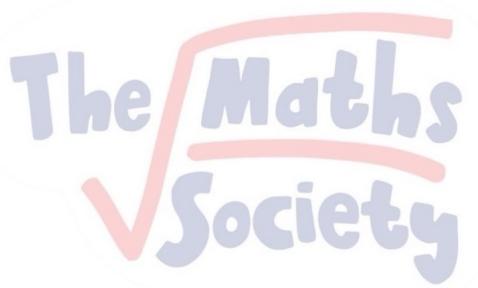


(e)

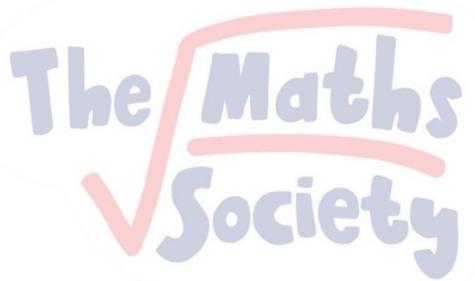


(f)



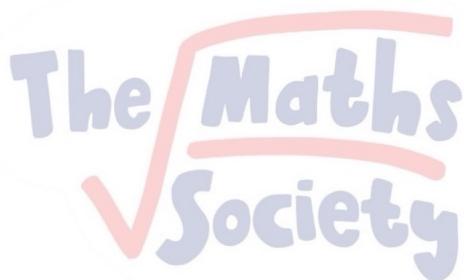
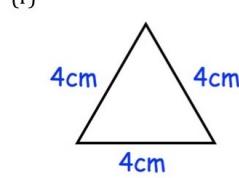
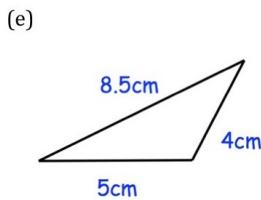
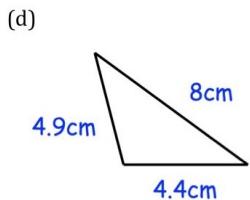
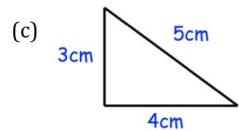
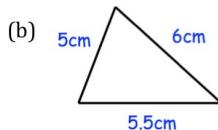
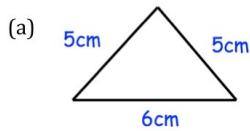


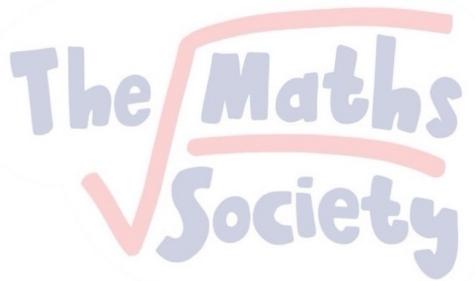
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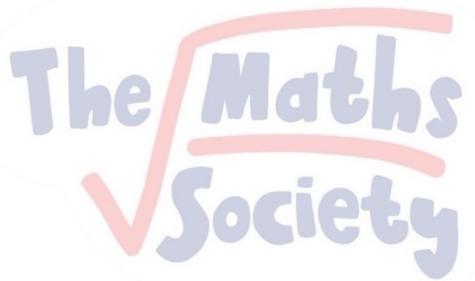
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Question 3: Accurately construct the following triangles.





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