Topic 13

GEOMETRY OF 2D SHAPES SLIDES

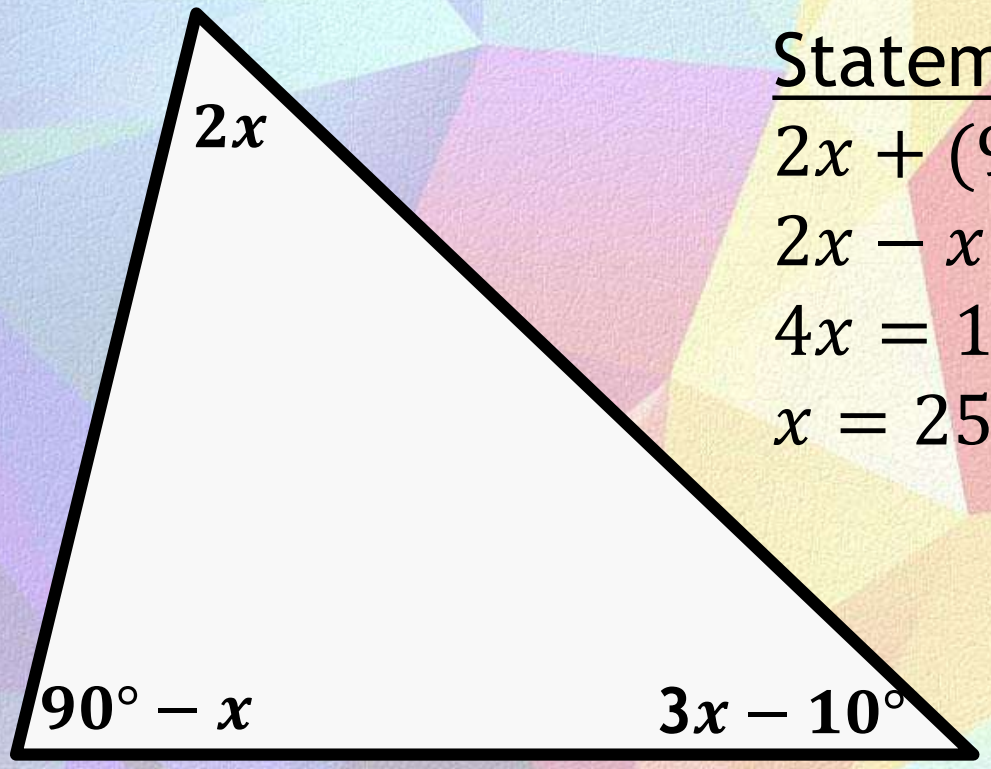
Topic 13

GEOMETRY OF 2D SHAPES VIDEO 1


TRIANGLES
(3 REASONS)

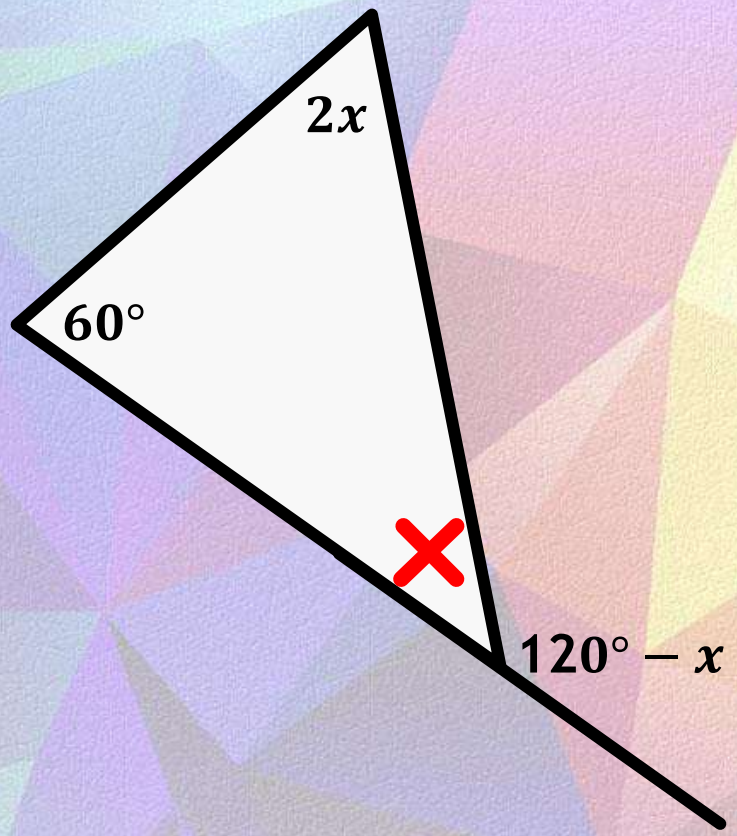
$\measuredangle s$ *in a* Δ

Angles of a Δ add up to **180°**.



Statement	Reason
$2x + (90° - x) + (3x - 10°) = 180°$	$\measuredangle s$ *in a* Δ
$2x - x + 3x = 180° - 90° + 10°$	
$4x = 100°$	
$x = 25°$	

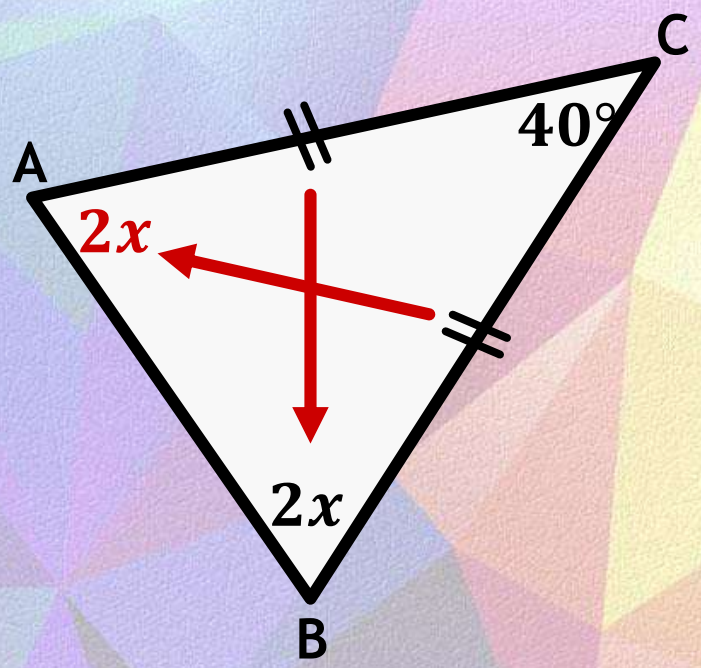
$Ext \angle of \Delta$



The exterior angle of a triangle is equal to the **SUM OF THE OPPOSITE INTERIOR ANGLES**.

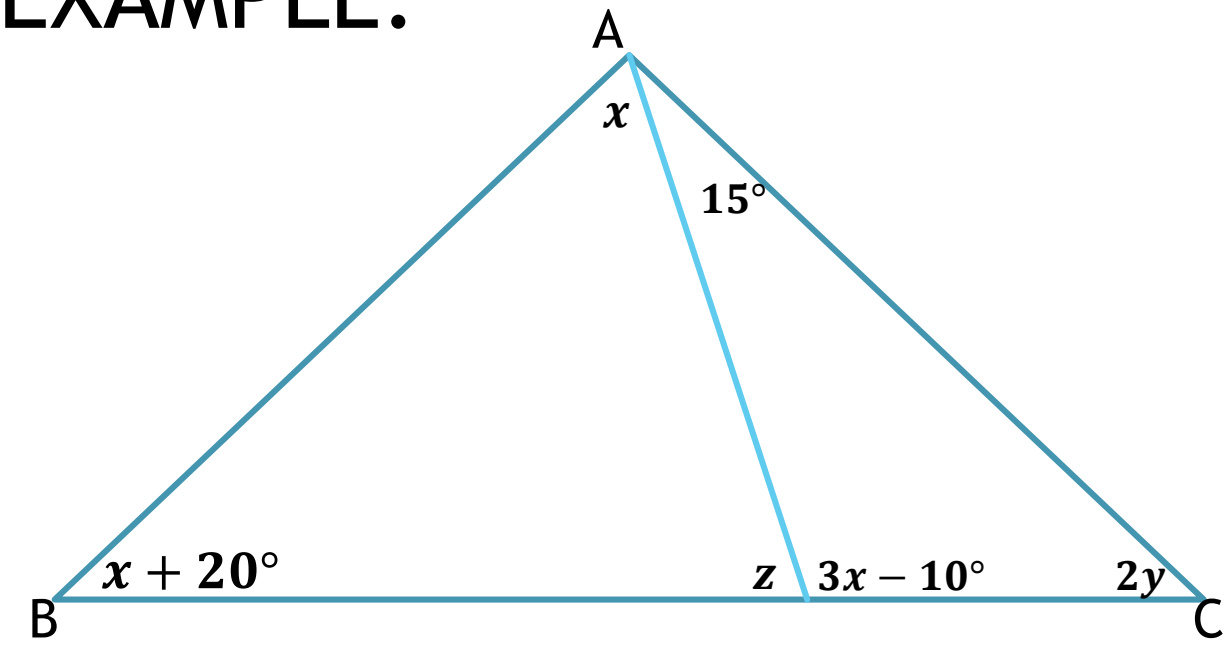
Statement	Reason
$2x + 60° = 120° - x$	$Ext \angle of \Delta$
$2x + x = 120° - 60°$	
$3x = 60°$	
$x = 20°$	

$\measuredangle s\ opp = sides$



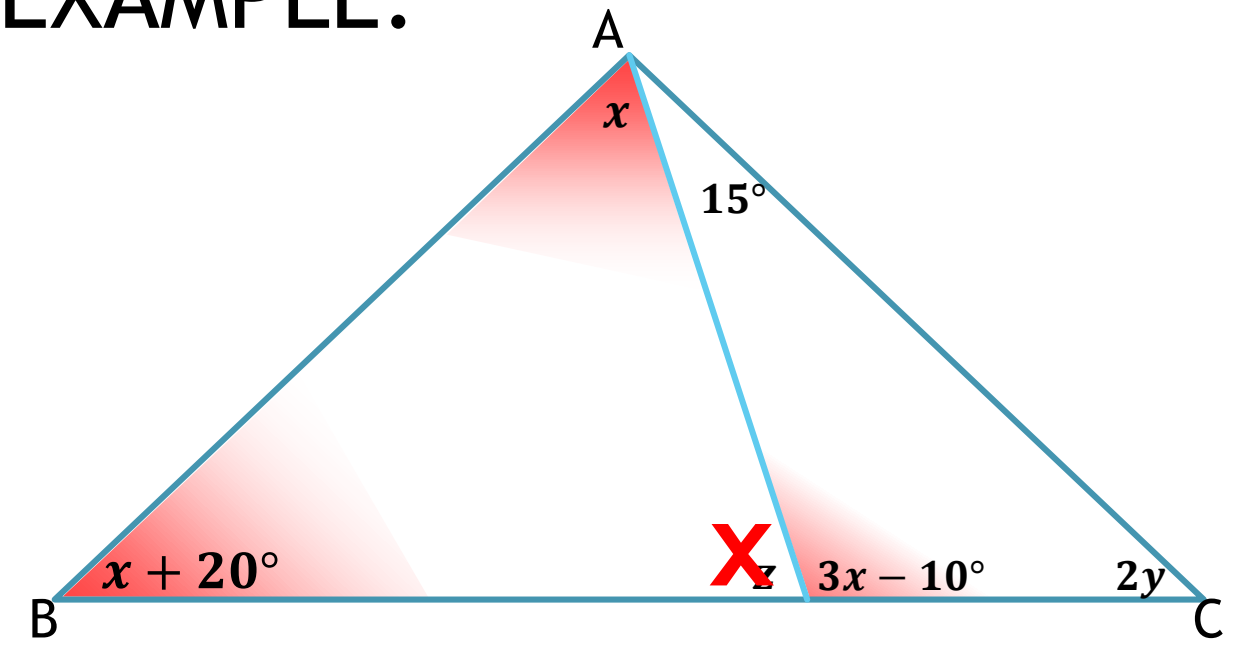
Statement	Reason
$\hat{A} = \hat{B} = 2x$	$\measuredangle s\ opp = sides$
$2x + 2x + 40° = 180°$	$\measuredangle s\ in\ a\ \Delta$
$4x = 180° - 40°$	
$4x = 140°$	
$x = 35°$	

EXAMPLE:



Solve for the unknown variables

EXAMPLE:

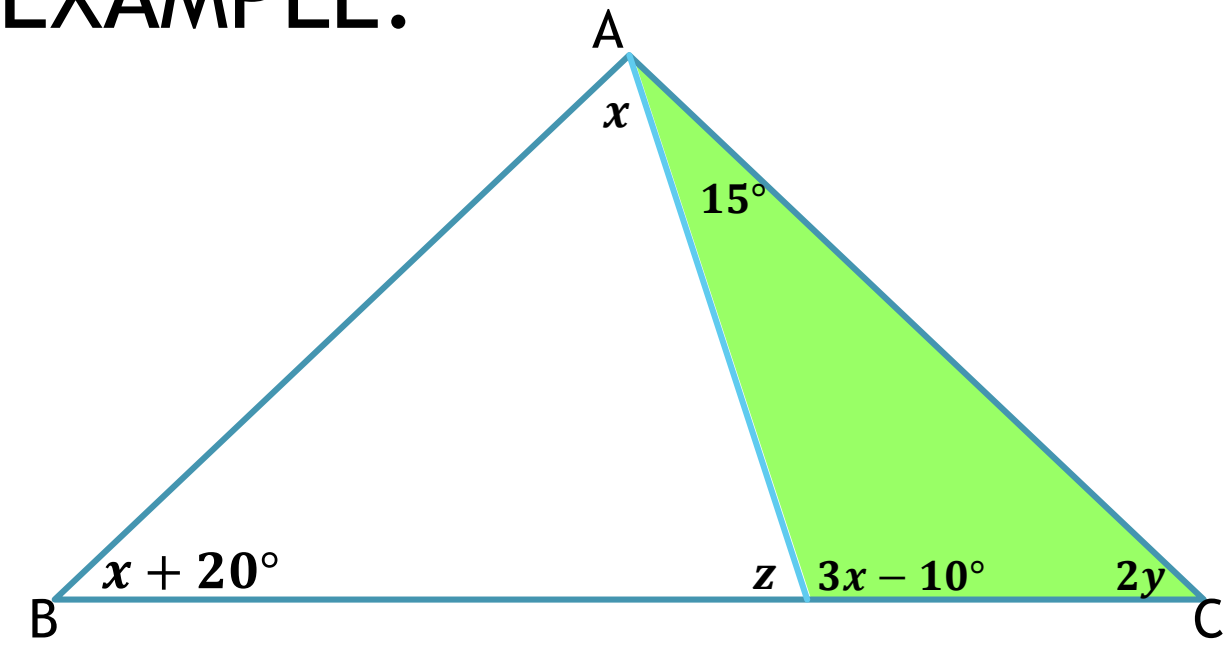


Solve for the unknown variables

Solve for x

Statement	Reason
$(x + 20°) + x = (3x - 10°)$	$Ext \angle of\ \Delta$
$x + 20° + x = 3x - 10°$	
$x + x - 3x = -10° - 20°$	
$-x = -30°$	
$x = 30°$	

EXAMPLE:



Solve for the unknown variables

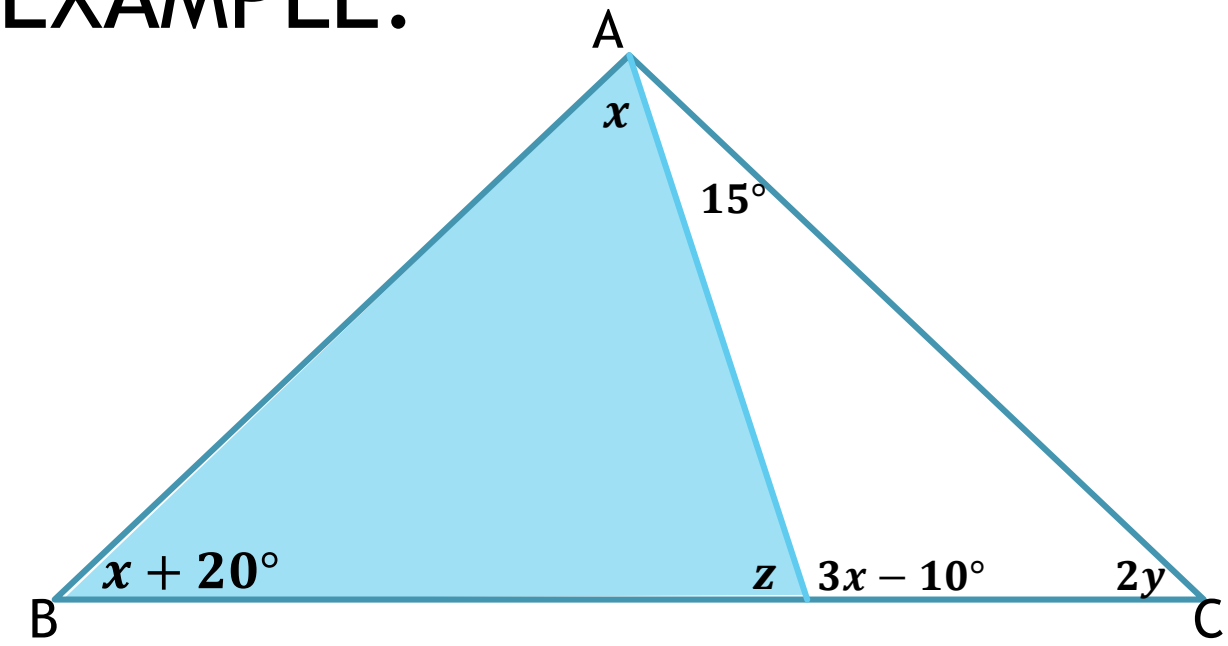
Solve for x

Statement	Reason
$(x + 20°) + x = (3x - 10°)$	$Ext \angle of\ \Delta$
$x + 20° + x = 3x - 10°$	
$x + x - 3x = -10° - 20°$	
$-x = -30°$	
$x = 30°$	

Solve for y

Statement	Reason
$15° + (3x - 10°) + 2y = 180°$	$\angle's\ in\ a\ \Delta$
$15° + 3(30°) - 10° + 2y = 180°$	
$15° + 90° - 10° + 2y = 180°$	
$95 + 2y = 180$	
$2y = 180 - 95$	
$2y = 85$	
$y = 42{,}5$	

EXAMPLE:



Solve for the unknown variables

Solve for y

Statement	Reason
$15° + (3x - 10°) + 2y = 180°$	$\angle's\ in\ a\ \Delta$
$15° + 3(30°) - 10° + 2y = 180°$	
$15° + 90° - 10° + 2y = 180°$	
$95 + 2y = 180$	
$2y = 180 - 95$	
$2y = 85$	
$y = 42{,}5$	

Solve for x

Statement	Reason
$(x + 20°) + x = (3x - 10°)$	$Ext \angle of\ \Delta$
$x + 20° + x = 3x - 10°$	
$x + x - 3x = -10° - 20°$	
$-x = -30°$	
$x = 30°$	

Solve for z

Statement	Reason
$x + 20° + x + z = 180°$	$\angle's\ in\ a\ \Delta$
$(30°) + 20° + (30°) + z = 180°$	
$80° + z = 180°$	
$z = 180° - 80°$	
$z = 100°$	

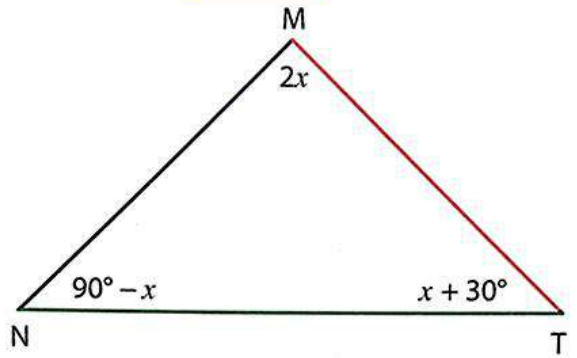
EXERCISE 13.1

Pg. 126 (No. 1a-d, 2a)

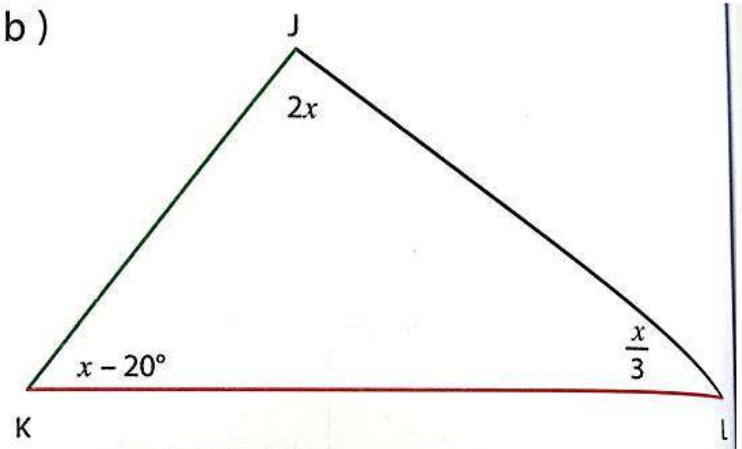
EXERCISE 13.1 Pg. 126 (No. 1a-d, 2a)

1. Solve for x and classify each triangle.

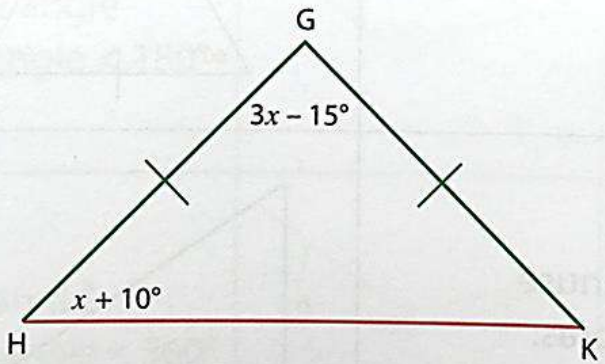
a)



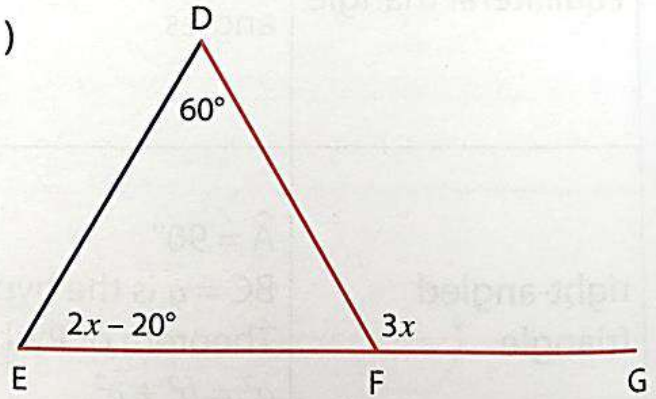
b)



c)

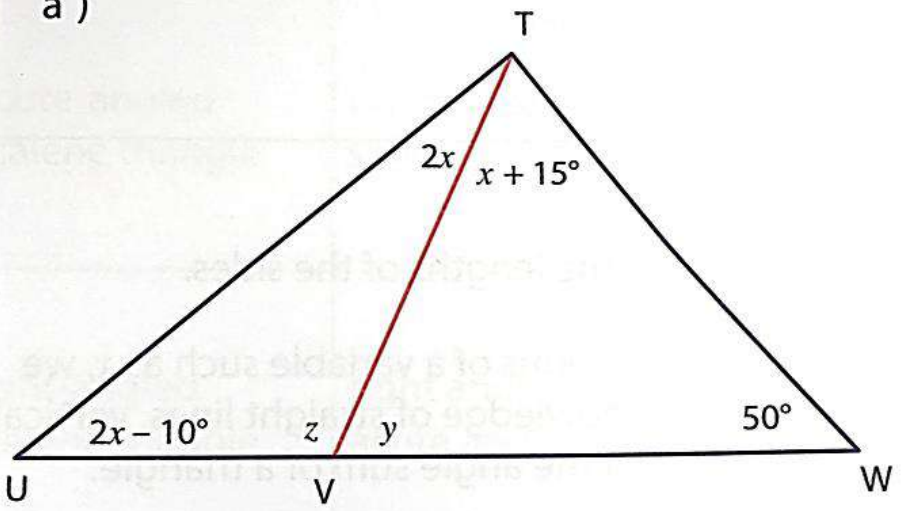


d)



2. Solve for x, y and z and classify, with reasons, the

a)



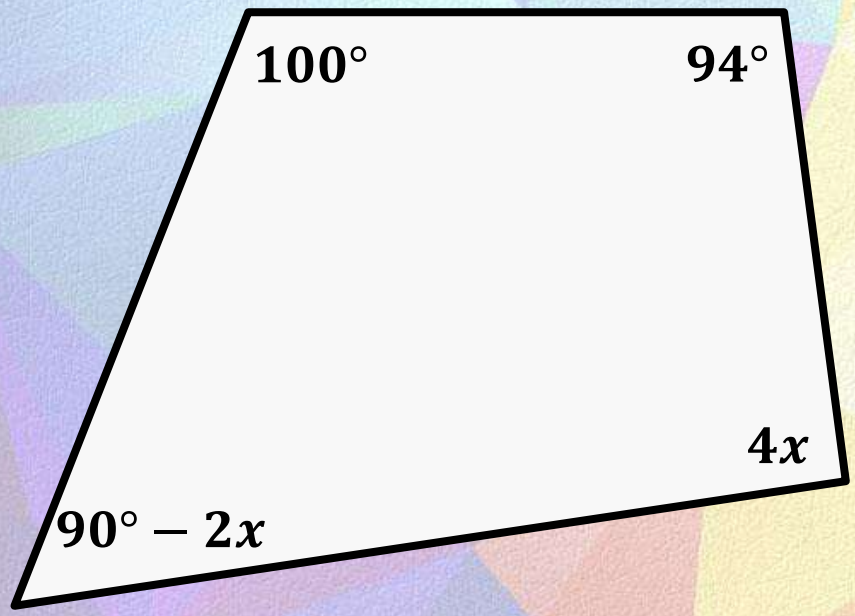
Topic 13

GEOMETRY OF 2D SHAPES VIDEO 2

QUADRILATERALS

(1 REASON)

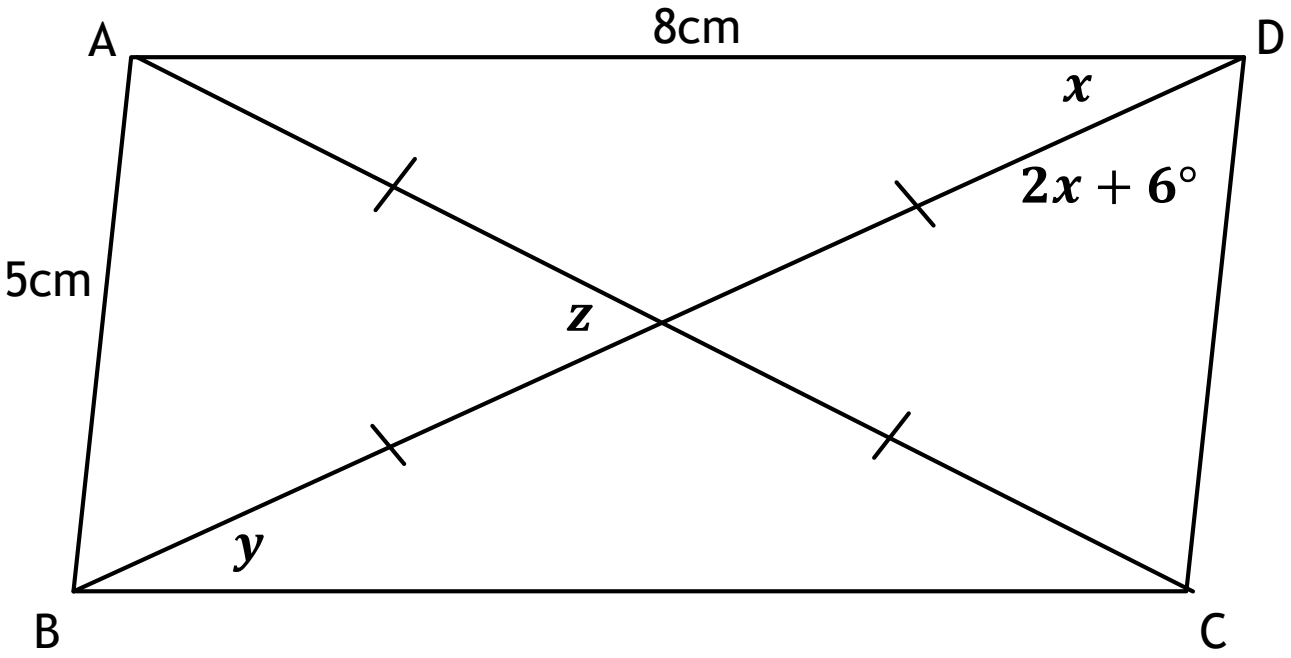
$\measuredangle s$ *of a quad*



Angles of a *quad* add up to **360°**.

Statement	Reason
$100° + (90° - 2x) + 4x + 94° = 360°$	$\measuredangle s$ *of a quad*
$100° + 90° - 2x + 4x + 94° = 360°$	
$284° + 2x = 360°$	
$2x = 360° - 284°$	
$2x = 76°$	
$x = 38°$	

EXAMPLE:



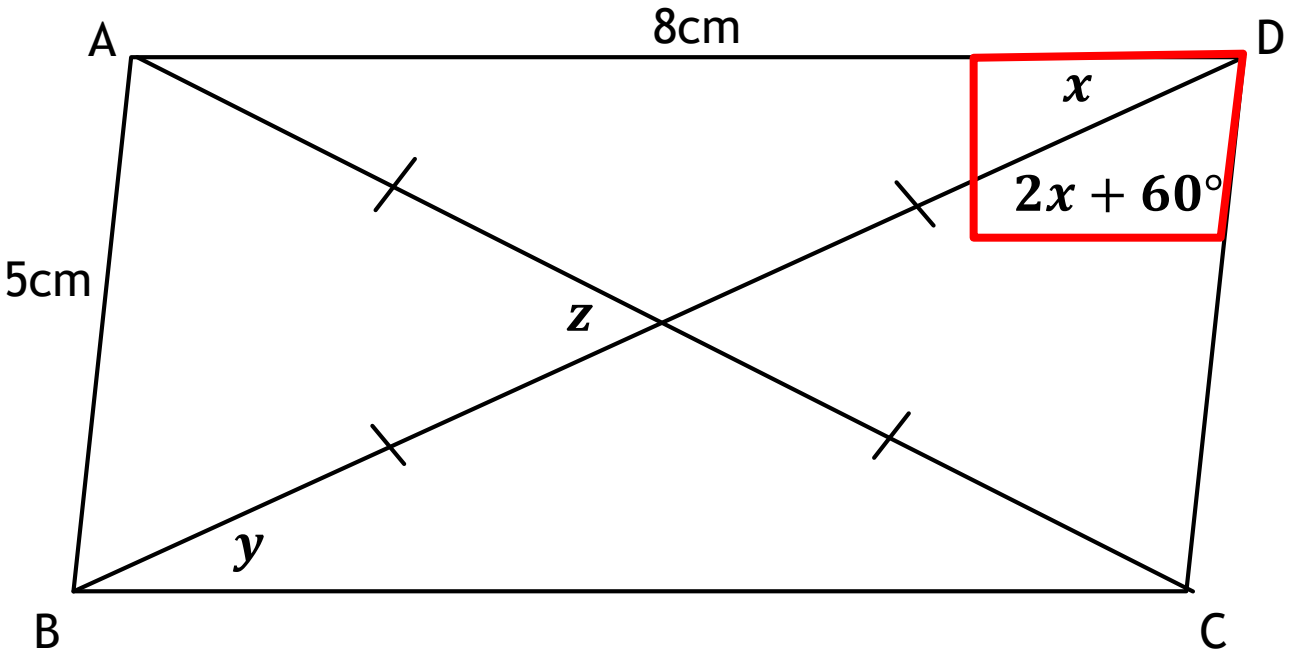
1.) Classify the quadrilateral ABCD, giving reasons for you answer.

Diagonals are equal *(Square or Rectangle)*
Opposite sides are equal
∴ It must be a rectangle

Properties of Quads Pg.127
Sharp Worksheet on Google Classroom

2.) Determine giving reasons x, y and z

EXAMPLE:



1.) Classify the quadrilateral ABCD, giving reasons for you answer.

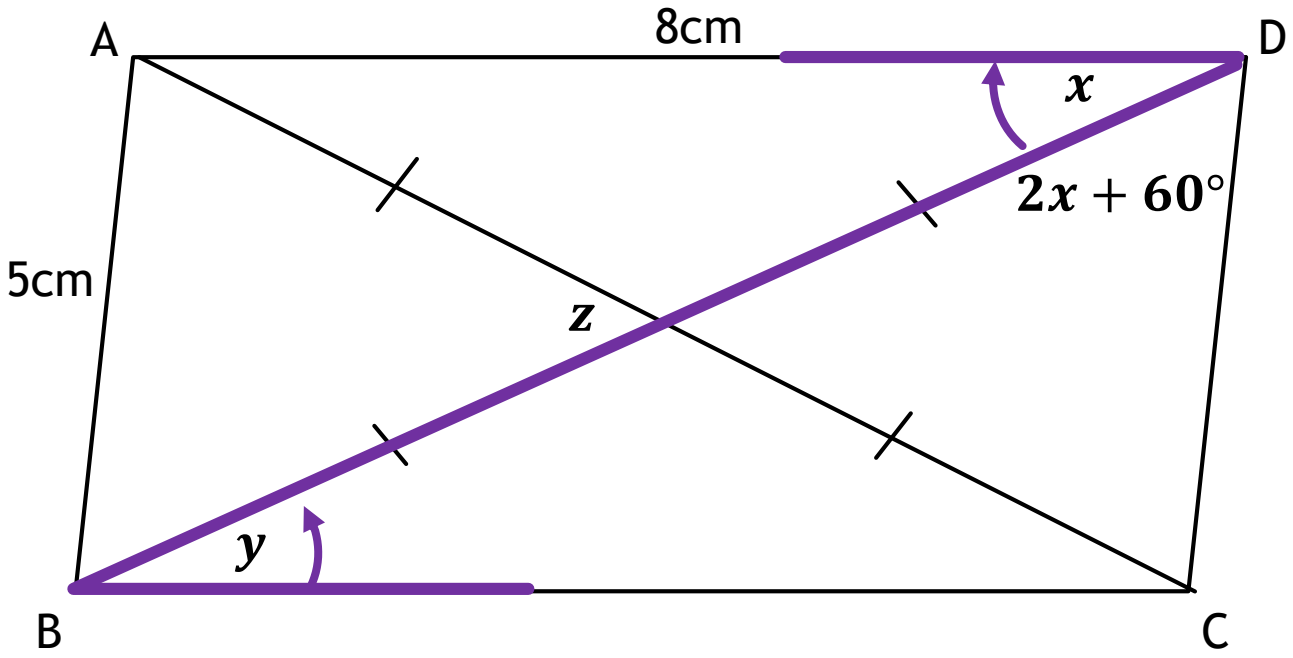
Diagonals are equal *(Square or Rectangle)*
Opposite sides are equal
∴ It must be a rectangle

Properties of Quads Pg.127 Sharp Worksheet on Google Classroom

2.) Determine giving reasons x, y *and* z

$x + 2x + 60° = 90°$ *Adj Comp ∠'s or*
$3x = 90° - 60°$ *Properties of a rect*
$3x = 30°$
$x = 10°$

EXAMPLE:



1.) Classify the quadrilateral ABCD, giving reasons for you answer.

Diagonals are equal *(Square or Rectangle)*
Opposite sides are equal
∴ It must be a rectangle

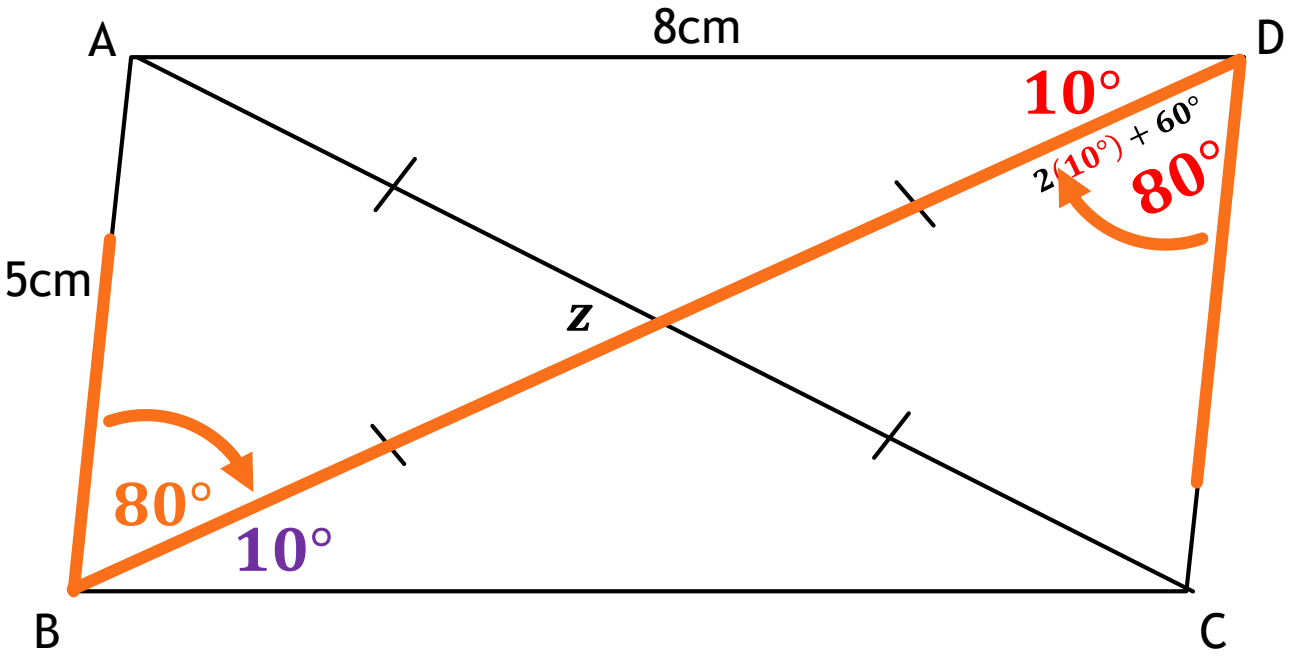
Properties of Quads Pg.127 Sharp Worksheet on Google Classroom

2.) Determine giving reasons x, y *and* z

$x + 2x + 60° = 90°$ — *Adj Comp ∠'s or*
$3x = 90° - 60°$ — *Properties of a rect*
$3x = 30°$
$x = 10°$

$y = x = 10°$ — $alt\angle's =; AD \parallel BC$

EXAMPLE:



1.) Classify the quadrilateral ABCD, giving reasons for you answer.

Diagonals are equal *(Square or Rectangle)*
Opposite sides are equal
∴ It must be a rectangle

Properties of Quads Pg.127 Sharp Worksheet on Google Classroom

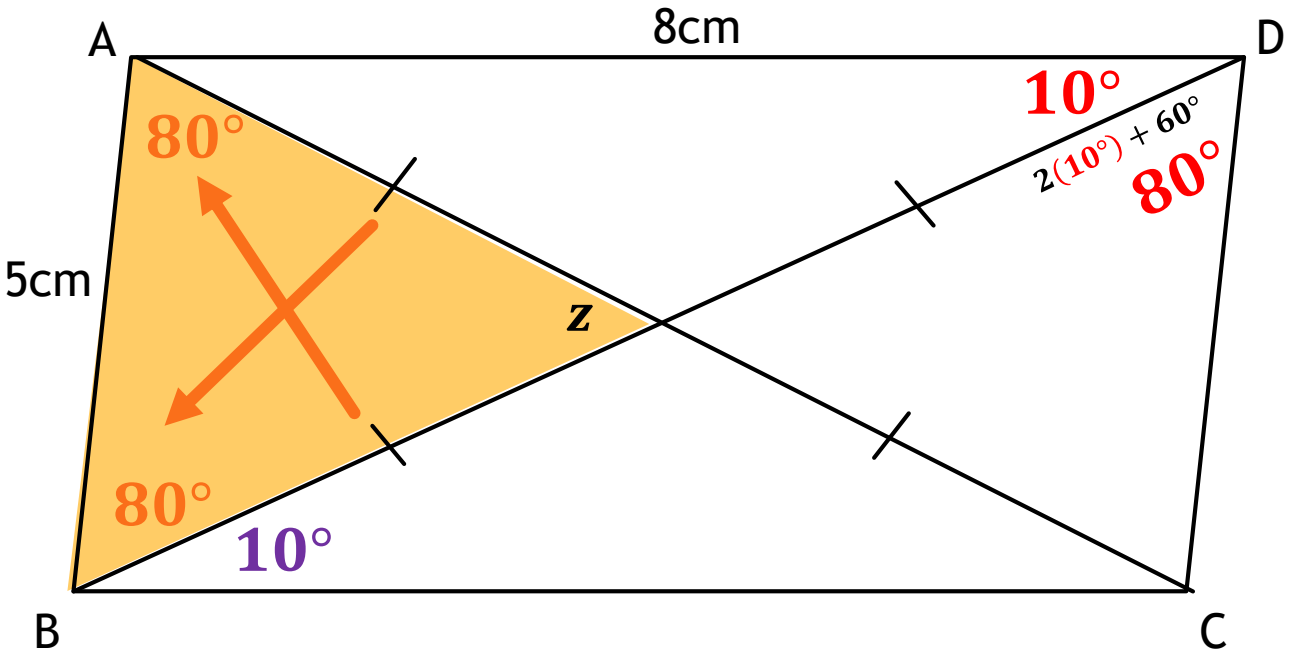
2.) **Determine giving reasons x, y and z**

$x + 2x + 60° = 90°$ — *Adj Comp ∠'s or Properties of a rect*
$3x = 90° - 60°$
$3x = 30°$
$x = 10°$

$y = x = 10°$ — $alt\angle's =; AD \parallel BC$

$A\hat{B}D = 80°$ — $alt\angle's =; AB \parallel DC$

EXAMPLE:



1.) Classify the quadrilateral ABCD, giving reasons for you answer.

Diagonals are equal *(Square or Rectangle)*
Opposite sides are equal
∴ It must be a rectangle

Properties of Quads Pg.127 Sharp Worksheet on Google Classroom

2.) **Determine giving reasons x, y and z**

$x + 2x + 60° = 90°$ — *Adj Comp ∠'s or Properties of a rect*
$3x = 90° - 60°$
$3x = 30°$
$x = 10°$

$y = x = 10°$ — $alt\angle's =; AD \parallel BC$

$A\hat{B}D = 80°$ — $alt\angle's =; AB \parallel DC$
$B\hat{A}C = 80°$ — $\angle's\ opp = sides$
$80° + 80° + z = 180°$ — $\angle's\ in\ a\ \Delta$
$z = 180° - 80° - 80°$
$z = 20°$

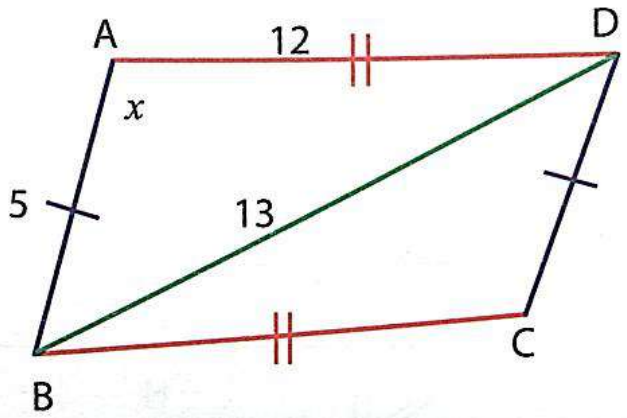
EXERCISE 13.2

Pg. 128 (No. 1,2,3)

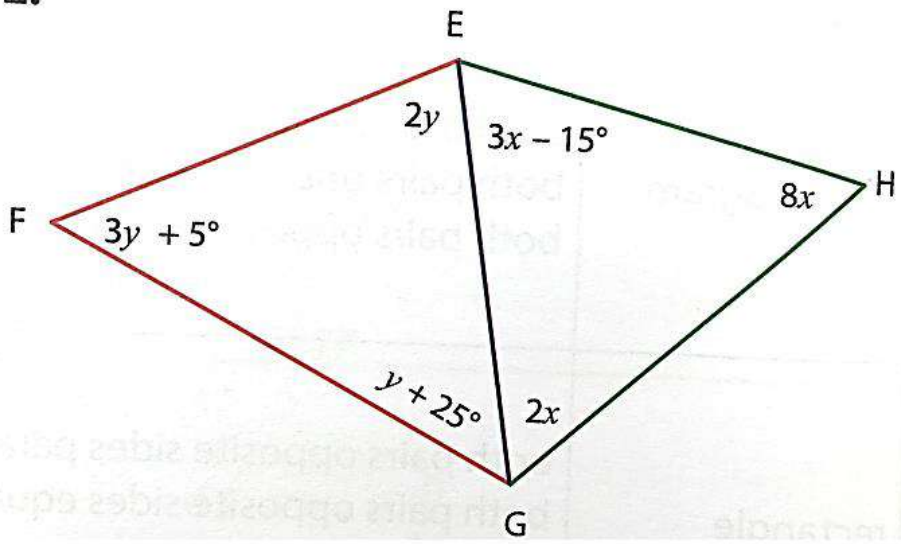
EXERCISE 13.2 Pg. 128 (No. 1,2,3)

Solve for x and/or y where necessary and then classify each quadrilateral.
Reasons must be given. Quarilaterals have not been drawn to scale.

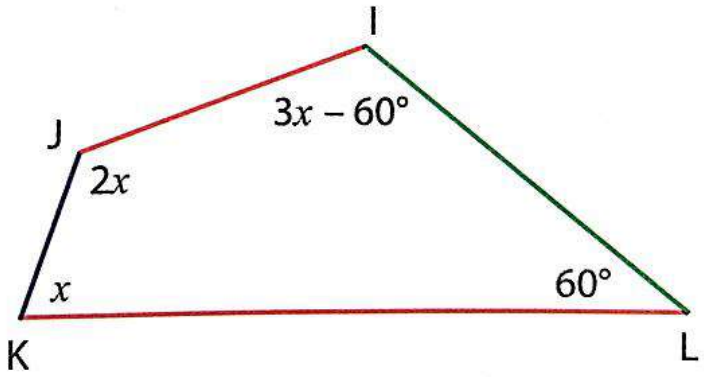
1.



2.



3.



Topic 13

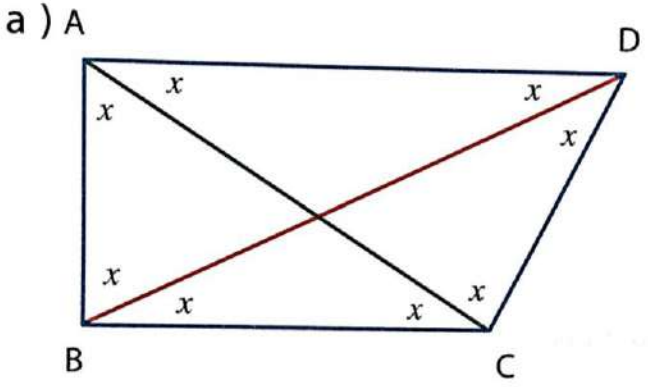
GEOMETRY OF 2D SHAPES VIDEO 3

PROPERTIES OF QUADRILATERALS

Properties of Quads Pg.127
Or Sharp Worksheet on
Google Classroom

Remember these are not drawn to scale!

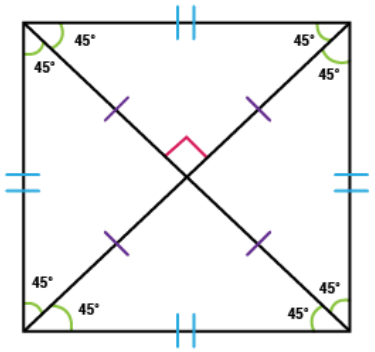
a)



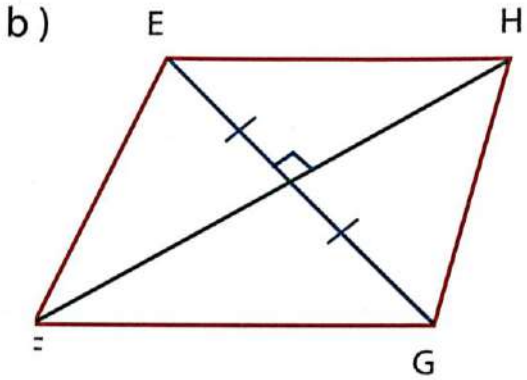
What do we know?
All angles at vertices are bisected
All angles are equal

What can we conclude?
ABCD is a square

What does it look like to scale?



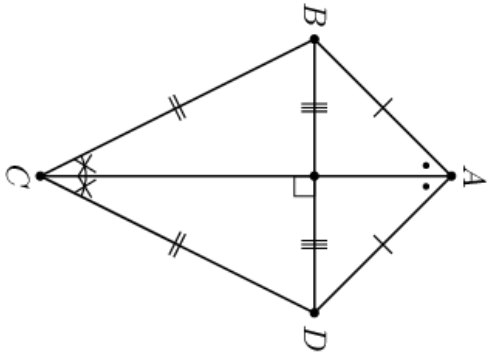
b)



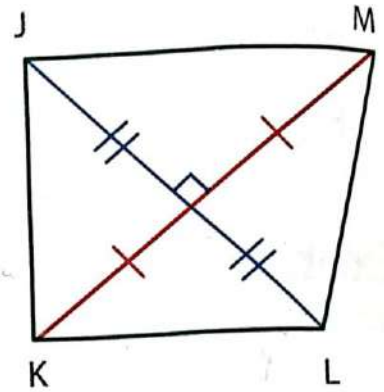
What do we know?
Diagonals intersect at 90°
1 Diagonal is Bisected

What can we conclude?
EFGH is a Kite

What does it look like to scale?



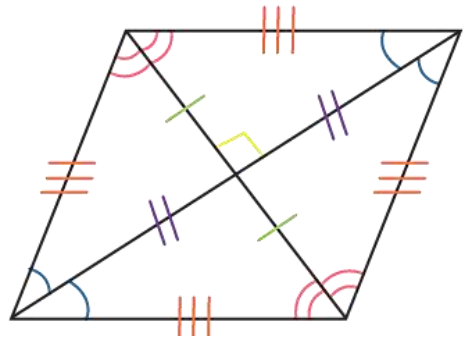
c)



What do we know?
Diagonals intersect at 90°
2 Diagonals are Bisected

What can we conclude?
JKLM is a rhombus

What does it look like to scale?



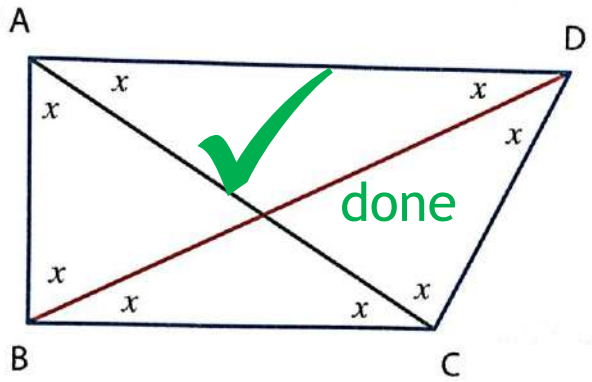
EXERCISE 13.4

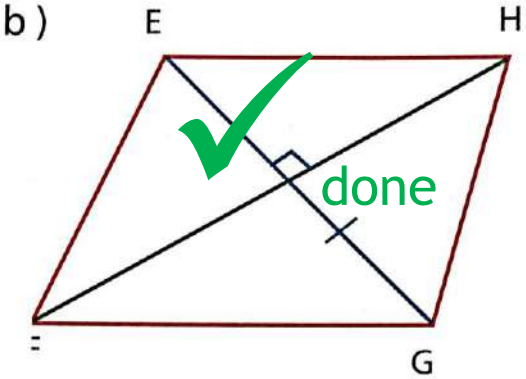
Pg. 128 (No. 1d-i)

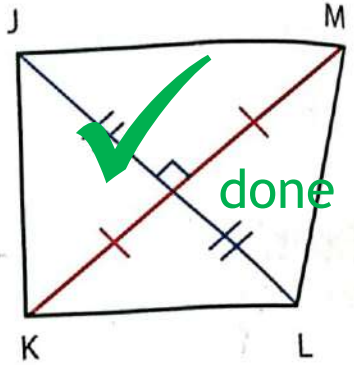
EXERCISE 13.4 Pg. 130 (No. 1 d,e,f,g,h,i)

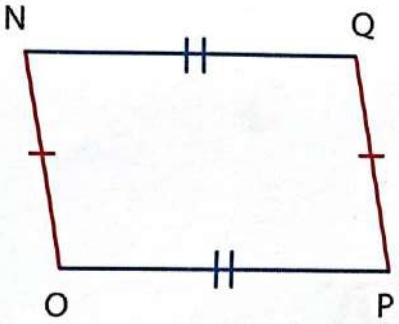
Properties of Quads Pg.127
Or Sharp Worksheet on
Google Classroom

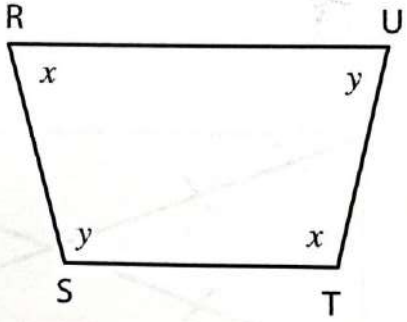
Classify each quadrilateral and briefly justify your answer. The sketches are not drawn to scale

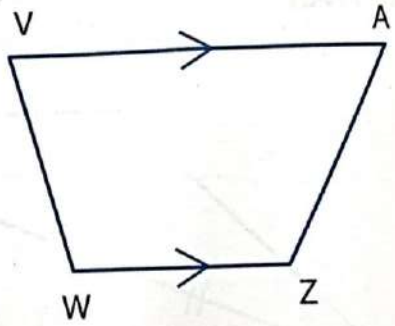
a) 

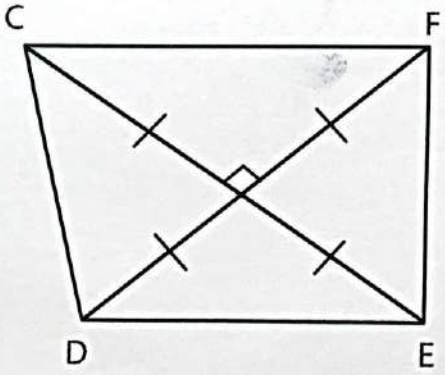
b) 

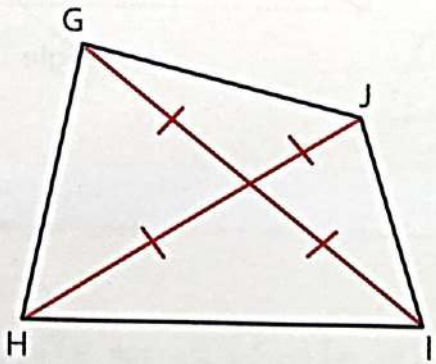
c) 

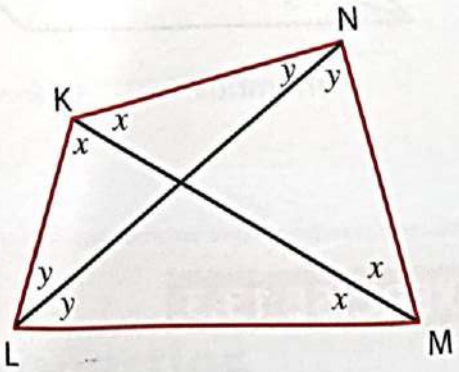
d) 

e) 

f) 

g) 

h) 

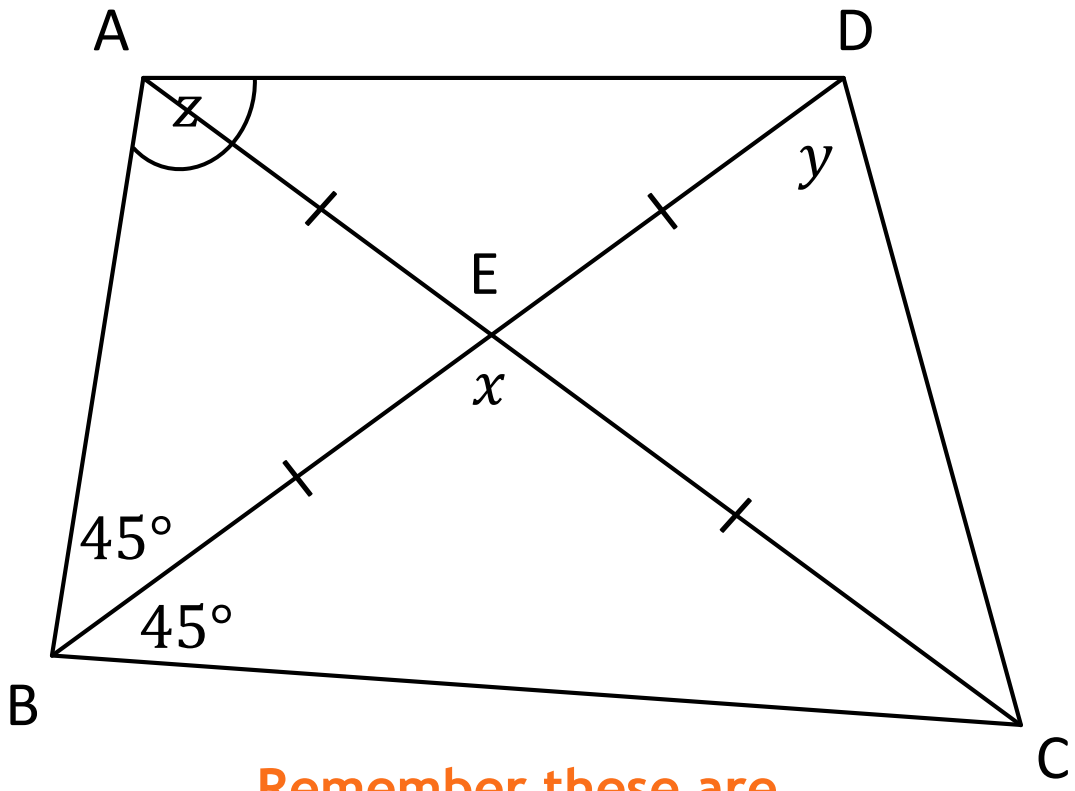
i) 

Topic 13

GEOMETRY OF 2D SHAPES VIDEO 4

PROPERTIES OF QUADRILATERALS (Continued)

EXAMPLE:



Remember these are not drawn to scale!

a.) Classify quadrilateral ABCD, giving reasons.

What do we know?

Angles are bisected and equal to 45°

All diagonals are bisected and are equal

What can we conclude?

ABCD is a **square**

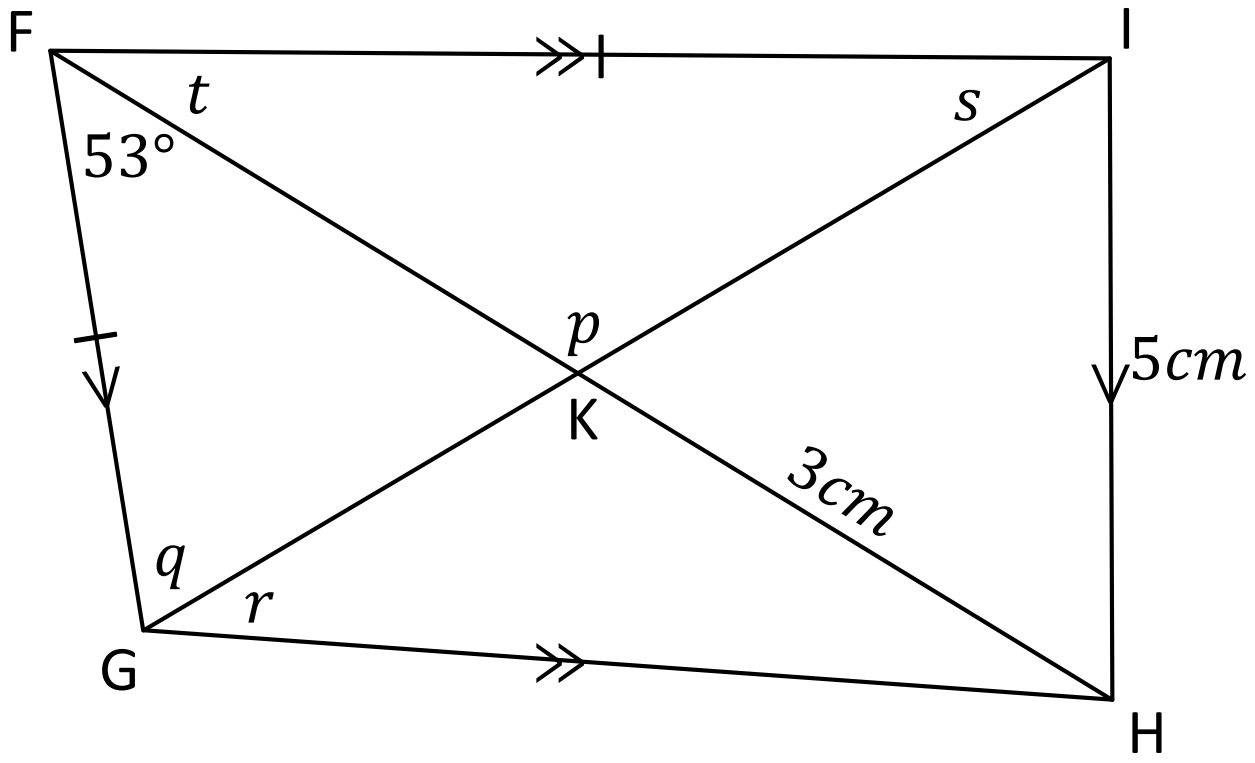
b.) Calculate, giving reasons, x, y and z

Statement	Reason
$x = 90°$	$Prop\ of\ a\ square$ $Diagonals\ intersect\ at\ 90°$
$y = 45°$	$alt\angle's =; AB \parallel DC$
$z = 90°$	$Prop\ of\ a\ square$ $Vertices\ of\ a\ square\ =\ 90°$

EXERCISE 13.5

Pg. 131 (No. 2ab)

EXERCISE 13.5 Pg. 131 (No. 2ab)



a.) Classify quadrilateral FGHI, giving reasons.

b.) Calculate, giving reasons, p, q, r, s and t.