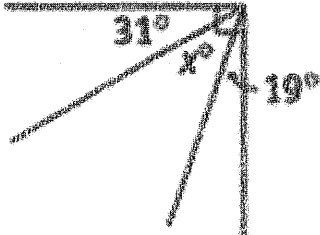
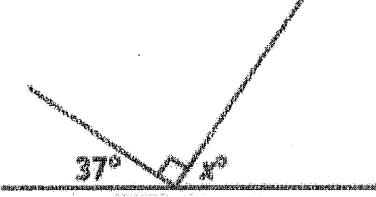
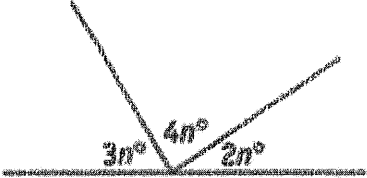
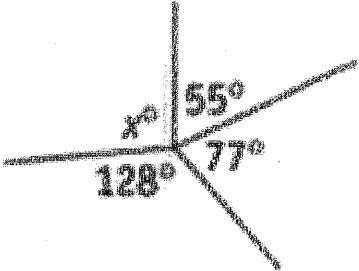
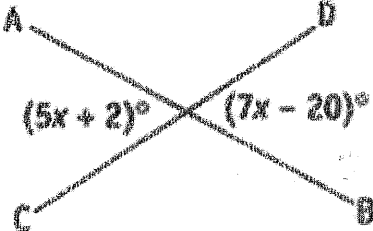
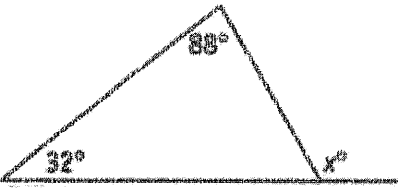
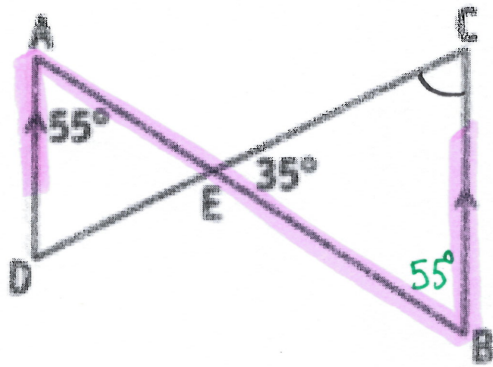


Properties of Geometrical Figures Topic Test

1. Find the pronumeral in each diagram giving reasons.

	$x = 90 - (31 + 19)$ $= 40^\circ$
	$x = 180 - (37 + 90)$ $= 53^\circ$ <p>(angles on a straight line)</p>
	$3n + 2n + 4n = 180$ $\frac{9n}{9} = \frac{180}{9}$ $n = 20^\circ \text{ (angles on a straight line)}$
	$x = 360 - (55 + 77 + 128)$ $= 100^\circ$ <p>(angles at a point)</p>
	$5x + 2 = 7x - 20$ $\begin{array}{r} -5x \\ \hline 2 = 2x - 20 \\ +20 \\ \hline 22 = 2x \\ \frac{22}{2} = \frac{2x}{2} \end{array}$ <p>$x = 11^\circ$ (vertically opposite angles)</p>
	$x = 88 + 32$ $= 120^\circ$ <p>(the exterior angle of a triangle is equal to the sum of the 2 opposite interior angles)</p>

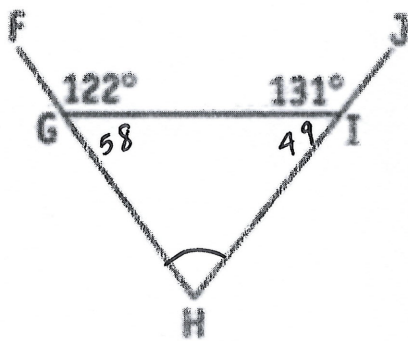
2. AB and CD intersect at E. Find the size of $\angle ECB$ giving reasons.



$$\angle EBC = 55^\circ \text{ (alternate angles on parallel lines)}$$

$$\begin{aligned} \therefore \angle ECB &= 180 - (35 + 55) \\ &= 90^\circ \text{ (angle sum of a triangle)} \end{aligned}$$

3. Find $\angle FHJ$ giving reasons.

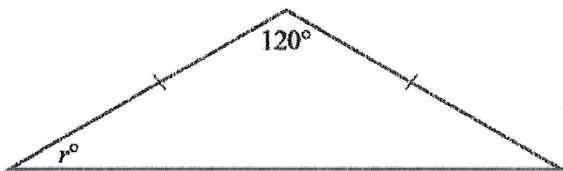


$$\begin{aligned} \angle IGH &= 180 - 122 \\ &= 58^\circ \text{ (angles on a straight line)} \end{aligned}$$

Similarly $\angle GIH = 180 - 131 = 49^\circ$

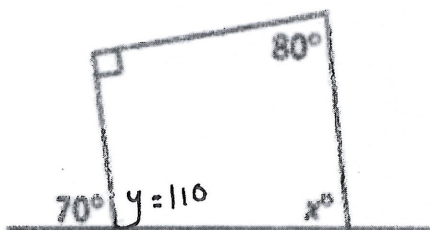
$$\begin{aligned} \therefore \angle FHJ &= 180 - (58 + 49) \\ &= 73^\circ \text{ (angle sum of a triangle)} \end{aligned}$$

4. Find r giving reasons.



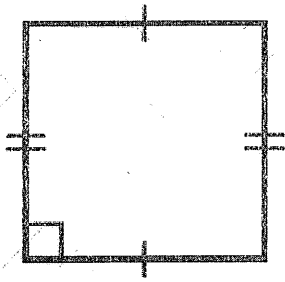
$$\begin{aligned} r &= \frac{180 - 120}{2} \\ &= 30^\circ \end{aligned} \text{ (angles opposite equal sides of a triangle AND angle sum of a triangle)}$$

5. Find x giving reasons.

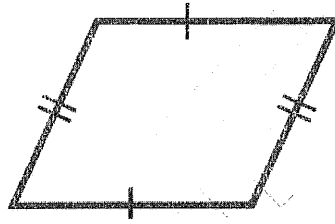


$$\begin{aligned} y &= 180 - 70 \\ &= 110^\circ \text{ (angles on a straight line)} \\ \therefore x &= 360 - (90 + 80 + 110) \\ &= 80^\circ \text{ (angle sum of a quadrilateral)} \end{aligned}$$

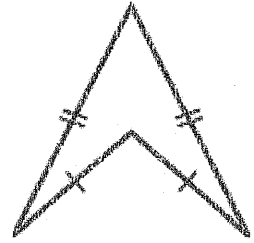
6. Based on the information in the diagrams below, choose the best name for each of these shapes. Each shape has a different name.



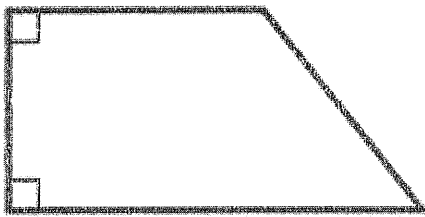
rectangle



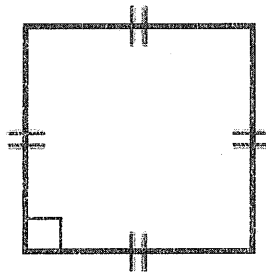
parallelogram



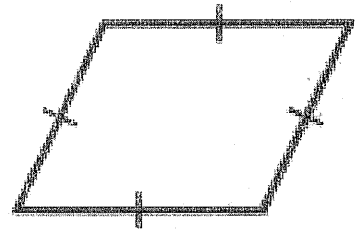
kite



trapezium

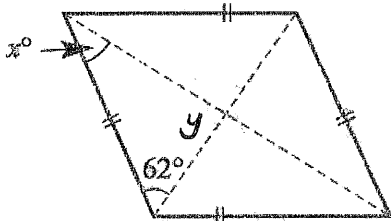


square



rhombus

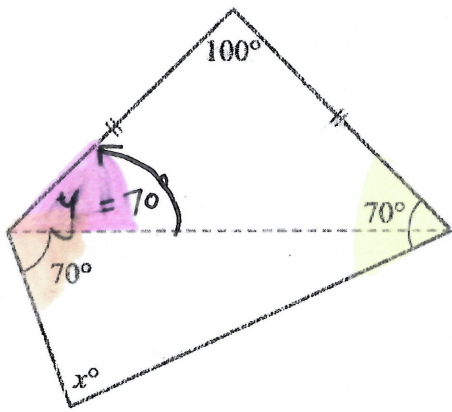
7. Find x giving reasons.



$y = 90^\circ$ (the diagonals of a rhombus are perpendicular)

$$\begin{aligned} \therefore x &= 180 - (62 + 90) \\ &= 28^\circ \quad (\text{angle sum of a triangle}) \end{aligned}$$

8. Find x giving reasons.

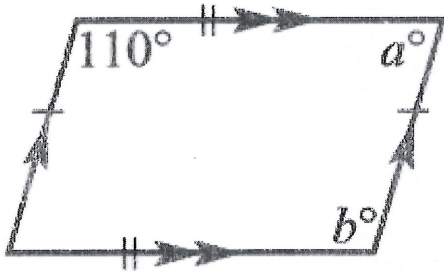


$y = 70^\circ$ (angles opposite equal sides of a triangle)

$$\therefore x = 360 - (100 + 70 + 70 + 70) = 50^\circ$$

(angle sum of a quadrilateral)

9. Find a and b giving reasons.

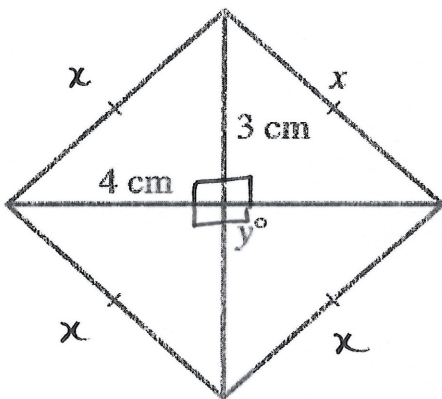


$b^\circ = 110^\circ$ (opposite angles of a parallelogram)

$$a = 180 - 110 = 70^\circ$$

(co-interior angles on parallel lines)

10. Find x and y giving reasons.



$y = 90^\circ$ (diagonals of a rhombus)

$$x^2 = 3^2 + 4^2$$

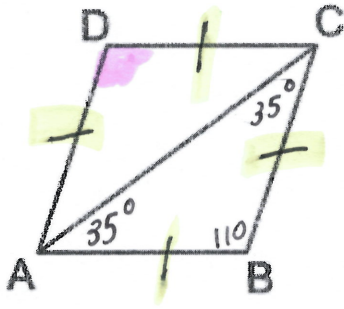
$$= 25$$

$$x = \sqrt{25}$$

$$= 5$$

(equal sides of a rhombus and Pythagoras' Theorem)

14. ABCD is a rhombus. $\angle CAB = 35^\circ$. Find $\angle CDA$.

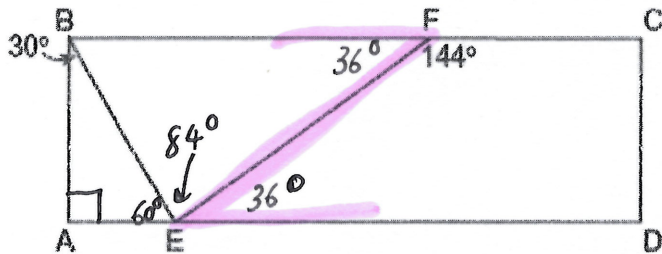


$\angle ACB = 35^\circ$ (equal sides of a rhombus and angles opposite equal sides of a triangle)

$$\begin{aligned} \therefore \angle CBA &= 180 - (35 + 35) \\ &= 110^\circ \text{ (angle sum of a triangle)} \end{aligned}$$

$$\therefore \angle CDA = 110^\circ \text{ (opposite angles of a rhombus)}$$

15. Challenge: ABCD is a rectangle. Find the size of $\angle BEF$ giving reasons.



$$\begin{aligned} \angle BEA &= 180 - (90 + 30) \text{ (interior angle of a rectangle and angle sum of a triangle)} \\ &= 60^\circ \end{aligned}$$

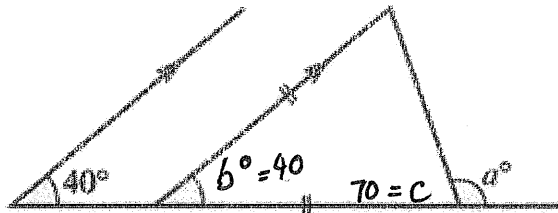
$$\begin{aligned} \angle BFE &= 180 - 144 \text{ (angles on a straight line)} \\ &= 36^\circ \end{aligned}$$

$BC \parallel AD$ (opposite sides of a rectangle)

$$\angle BFE = \angle FED \text{ (alternate angles on parallel lines)}$$

$$\begin{aligned} \therefore \angle BEF &= 180 - (60 + 36) \text{ (angles on a straight line)} \\ &= 84^\circ \end{aligned}$$

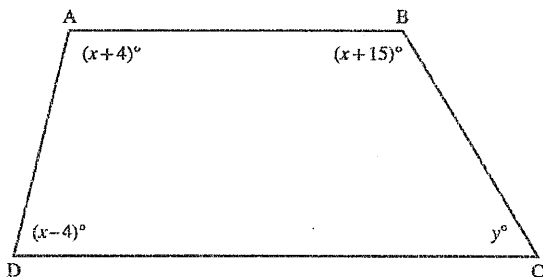
11. Find a giving reasons.



$b^\circ = 40^\circ$ (corresponding angles on parallel lines)

$\therefore c = \frac{180 - 40^\circ}{2}$ (angles opposite equal sides of a triangle and angle sum of a triangle)
 $= 70^\circ$

12. Find x and y giving reasons. $\therefore a = 180 - 70 = 110^\circ$ (angles on a straight line)



$x + 4 + x - 4 = 180$
 $2x = 180$
 $x = 90$ (co-interior angles on parallel lines)

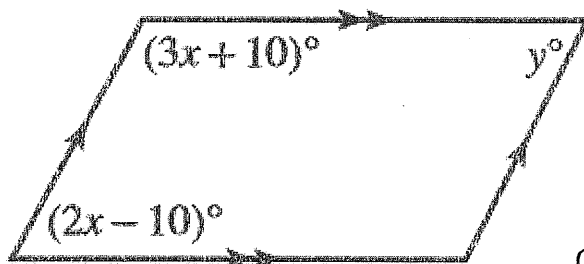
similarly, $x + 15 + y = 180$

$$90 + 15 + y = 180$$

$$105 + y = 180$$

$$\begin{array}{r} 105 + y = 180 \\ -105 \\ \hline y = 75^\circ \end{array}$$

13. Find x and y giving reasons.



$5x = 180$
 $x = 36^\circ$ (co-interior angles on parallel lines)

similarly, $3x + 10 + y = 180$

$$3(36) + 10 + y = 180$$

$$118 + y = 180$$

$$y = 62^\circ$$