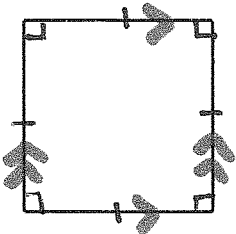
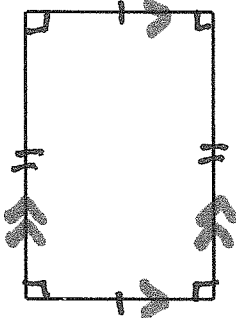
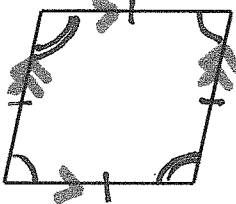
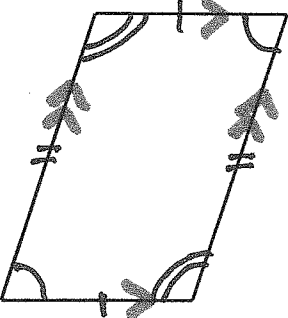
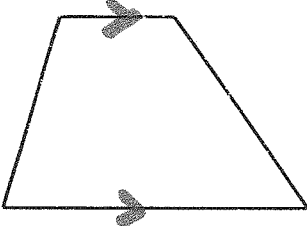
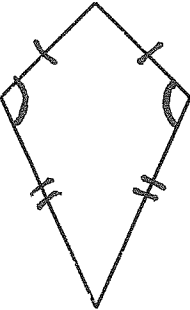
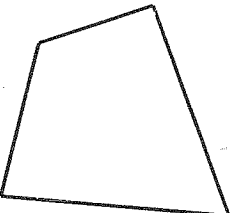


Quadrilaterals

Quadrilaterals are geometric shapes that have 4 sides.

Types of Quadrilaterals

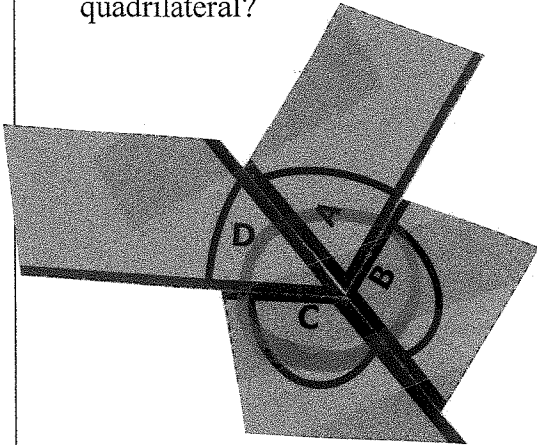
> parallel sides

			
Square	Rectangle	Rhombus	Parallelogram
Description: <ul style="list-style-type: none"> • 4 equal sides • 4 equal angles (90°) 	Description: <ul style="list-style-type: none"> • opposite sides are equal • 4 equal angles (90°) 	Description: <ul style="list-style-type: none"> • 4 equal sides • opposite corners are the same angle 	Description: <ul style="list-style-type: none"> • opposite sides are equal • opposite corners are the same angle
			
Trapezoid	Kite	Quadrilateral	
Description: <ul style="list-style-type: none"> • 2 parallel sides 	Description: <ul style="list-style-type: none"> • Adjacent sides equal • 1 pair of equal angles 	Description: <ul style="list-style-type: none"> • 4 sides 	

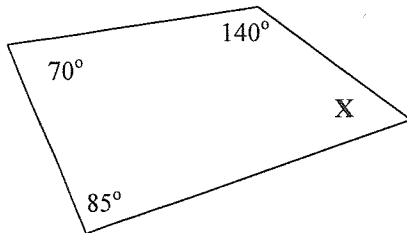
Sum of the Angles in a Quadrilateral (SAQT or Quad)

Investigate

- Cut the quadrilateral into three pieces along the dotted lines.
- Line the angles up so they are all pointing in towards each other (black corners touching).
- Tape them to your page in the space provided below.
- What do you notice about the angles in a quadrilateral?



Angles in a quadrilateral add to 360°



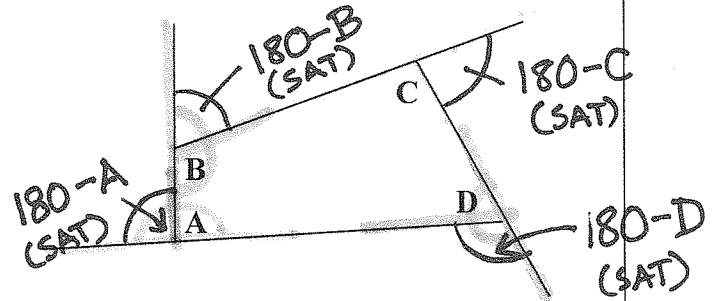
$$X + 140 + 70 + 85 = 360$$

$$X + 295 = 360$$

$$X = 65^\circ \quad (\text{QUAD})$$

Sum of the Exterior Angles in a Quadrilateral (SEAQT)

Mathematical Proof

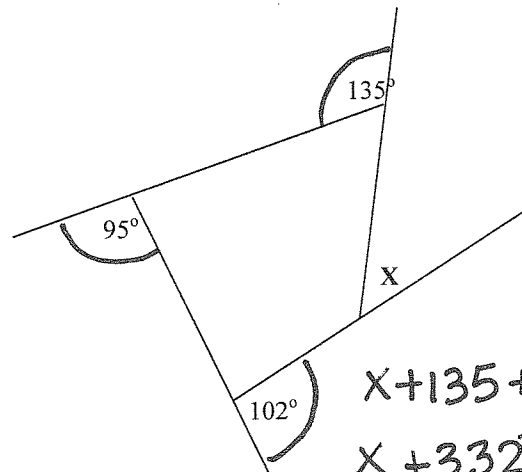


$$A + B + C + D = 360$$

$$\text{SUM} = 180 - A + 180 - B + 180 - C + 180 - D$$

$$\begin{aligned} \text{SUM} &= 720 - A - B - C - D \\ &= 720 - 360 \\ &= 360^\circ \end{aligned}$$

Exterior angles in a quadrilateral add to 360°

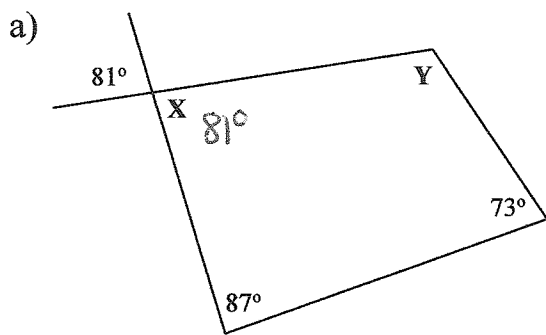


$$X + 135 + 95 + 102 = 360$$

$$X + 332 = 360$$

$$X = 28^\circ \quad (\text{SEAQT})$$

Practice

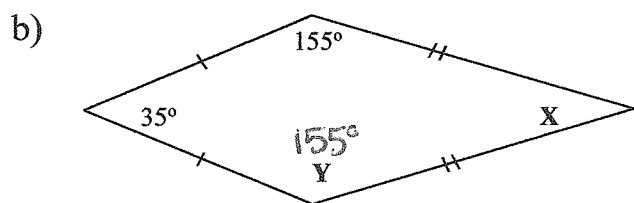


$$X = 81^\circ \text{ (OAT)}$$

$$Y + 81 + 87 + 73 = 360 \text{ (QUAD)}$$

$$Y + 241 = 360$$

$$Y = 119^\circ$$

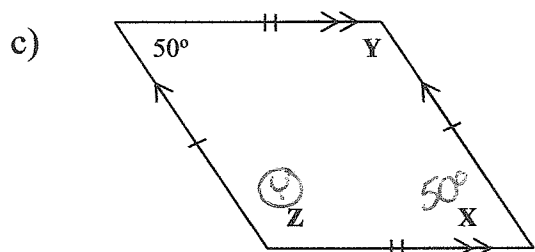


$$Y = 155^\circ \text{ (kite)}$$

$$X + 155 + 155 + 35 = 360 \text{ (QUAD)}$$

$$X + 345 = 360$$

$$X = 15^\circ$$



$$X = 50^\circ \text{ (parallelogram)}$$

$$Y + Y + 50 + 50 = 360$$

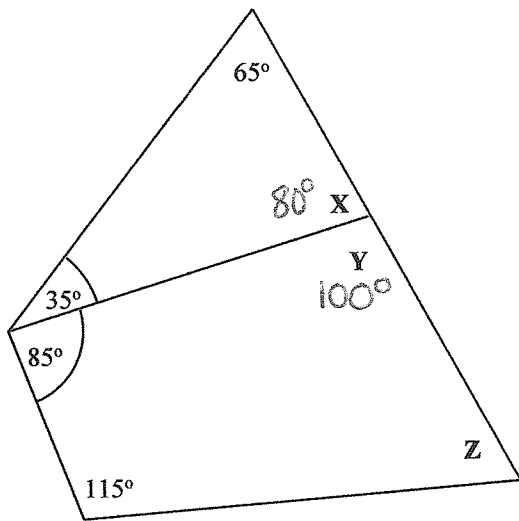
$$2Y + 100 = 360$$

$$2Y = 260$$

$$Y = 130^\circ$$

$$Z = 130^\circ$$

d)



$$X + 65 + 35 = 180 \text{ (SATT)}$$

$$X + 100 = 180$$

$$X = 80^\circ$$

$$Y + 80 = 180 \text{ (SAT)}$$

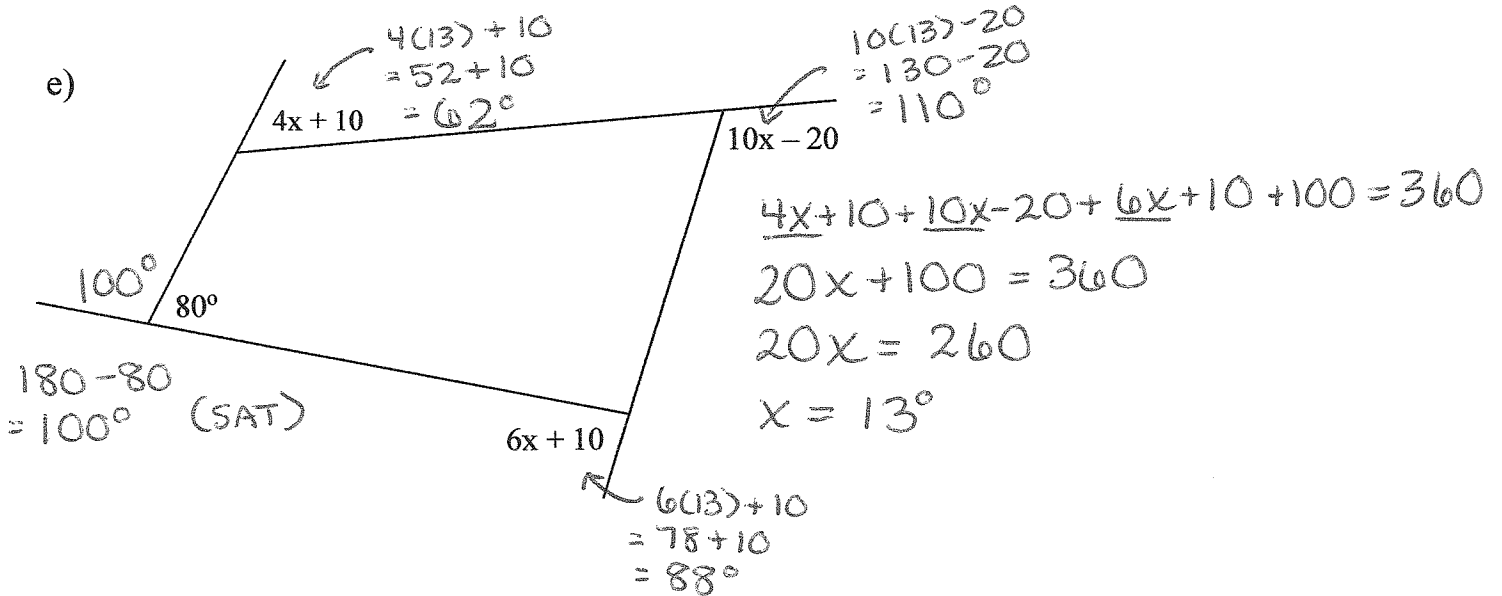
$$Y = 100^\circ$$

$$Z + 100 + 85 + 115 = 360 \text{ (QUAD)}$$

$$Z + 300 = 360$$

$$Z = 60^\circ$$

e)



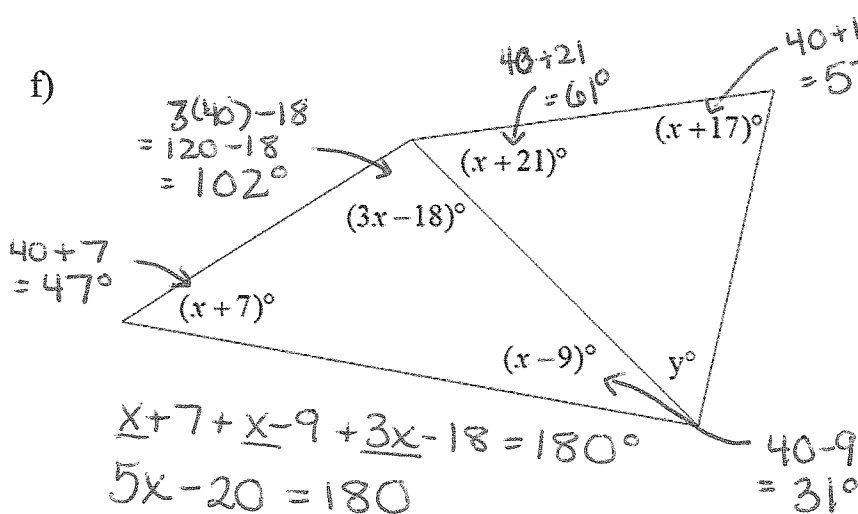
$$4x + 10 + 10x - 20 + 6x + 10 + 100 = 360$$

$$20x + 100 = 360$$

$$20x = 260$$

$$x = 13^\circ$$

f)



$$y + 61 + 57 = 180$$

$$y + 118 = 180$$

$$y = 62^\circ$$

$$x + 7 + x - 9 + 3x - 18 = 180^\circ$$

$$5x - 20 = 180$$

$$5x = 200$$

$$x = 40$$