

Ex.1 Make a conjecture about the product of two odd integers.

Sol.  $(1)(3) = 3$

$$(5)(7) = 35$$

$$(-5)(7) = -35$$

Pattern  $\rightarrow$  Each product is an odd integer.

Conjecture  $\rightarrow$  Product of two odd integers is an odd integer.

Q.1.  $(2)(4) = 8$

$$(-2)(-6) = 12$$

$$(-4)(6) = -24$$

Conjecture: Product of two even integers is an even integer.

Q.2.  $(2)(3) = 6$

$$(-4)(5) = -20$$

$$(6)(3) = 18$$

Conjecture: Product of an odd integer and an even integer is an even integer.

Q.3.  $2 + 4 = 6$

$$8 + (-6) = 2$$

$$(-10) + (-12) = -22$$

Conjecture: Sum of two even integers is an even integer.

Q.4.  $1 + 3 = 4$

$$(-5) + (-7) = -12$$

$$(-9) + 11 = 2$$

Conjecture: Sum of two odd integers is an odd integer.

Q.5.

Example One			Example Two			Example Three		
Step 1.	2	(Choose an int.)	Step 1.	3		Step 1.	-7	
Step 2.	4	(Multiply by 2)	Step 2.	6		Step 2.	-14	
Step 3.	5	(Add 1)	Step 3.	7		Step 3.	-13	
Step 4.	An odd int.	(Pattern)	Step 4.	An odd int.		Step 4.	An odd int.	

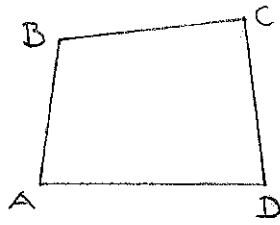
Step 5. Conjecture : Multiply an integer by 2, and then add 1.  
The result will be an odd number.

Q.6

Example One			Example Two			Example Three		
Step 1.	5		Step 1.	-9		Step 1.	8	
Step 2.	10		Step 2.	-18		Step 2.	16	
Step 3.	12		Step 3.	-16		Step 3.	18	
Step 4.	An even integer		Step 4.	An even integer		Step 4.	An even integer	

Step 5. Conjecture : Multiply an integer by 2, and then add 2.  
The result will be an even integer.

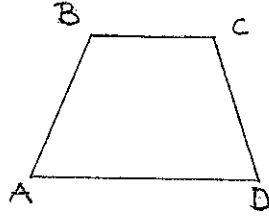
Q.7 First example



$$\begin{aligned} \angle A &= 83^\circ \\ \angle B &= 104^\circ \\ \angle C &= 91^\circ \\ \angle D &= 82^\circ \end{aligned}$$

$$\left\{ \begin{aligned} &\angle A + \angle B + \angle C + \angle D \\ &= 83^\circ + 104^\circ + 91^\circ + 82^\circ \\ &= 360^\circ \end{aligned} \right.$$

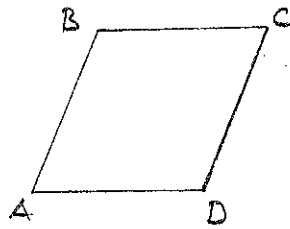
Second example



$$\begin{aligned} \angle A &= 68^\circ \\ \angle B &= 113^\circ \\ \angle C &= 108^\circ \\ \angle D &= 71^\circ \end{aligned}$$

$$\left\{ \begin{aligned} &\angle A + \angle B + \angle C + \angle D \\ &= 68^\circ + 113^\circ + 108^\circ + 71^\circ \\ &= 360^\circ \end{aligned} \right.$$

Third example



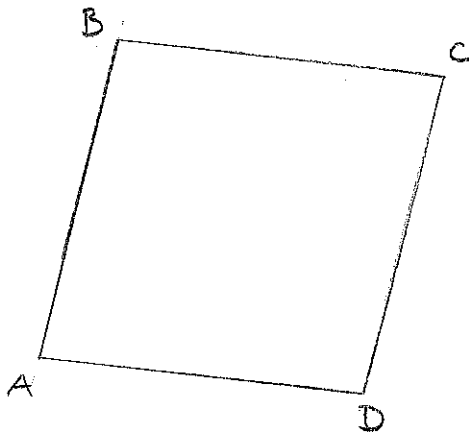
$$\begin{aligned} \angle A &= 67^\circ \\ \angle B &= 114^\circ \\ \angle C &= 67^\circ \\ \angle D &= 112^\circ \end{aligned}$$

$$\left\{ \begin{aligned} &\angle A + \angle B + \angle C + \angle D \\ &= 67^\circ + 114^\circ + 67^\circ + 112^\circ \\ &= 360^\circ \end{aligned} \right.$$

Pattern  $\rightarrow$  In each example  $\angle A + \angle B + \angle C + \angle D = 360^\circ$

conjecture  $\rightarrow$  Sum of the angles in a quadrilateral is  $360^\circ$ .

Q.8. First example

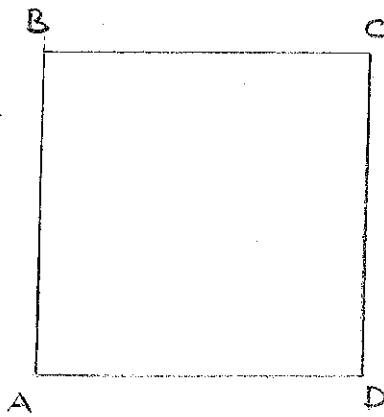


$$\begin{aligned} \angle A &= 82^\circ \\ \angle B &= 98^\circ \\ \angle C &= 82^\circ \\ \angle D &= 98^\circ \end{aligned}$$

$$\left\{ \begin{aligned} &\angle A = 82^\circ = \angle C \\ &\angle B = 98^\circ = \angle D \end{aligned} \right.$$

Q.8. Continues

Second example



$$\angle A = 89^\circ$$

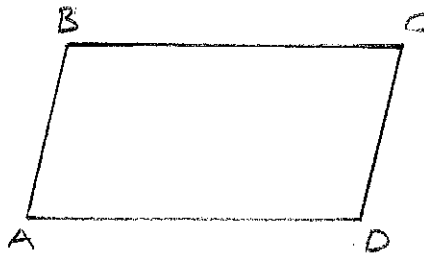
$$\angle B = 91^\circ$$

$$\angle C = 89^\circ$$

$$\angle D = 91^\circ$$

$$\left\{ \begin{array}{l} \angle A = 89^\circ = \angle C \\ \angle B = 91^\circ = \angle D \end{array} \right.$$

Third example



$$\angle A = 77^\circ$$

$$\angle B = 103^\circ$$

$$\angle C = 77^\circ$$

$$\angle D = 103^\circ$$

$$\left\{ \begin{array}{l} \angle A = 77^\circ = \angle C \\ \angle B = 103^\circ = \angle D \end{array} \right.$$

Pattern  $\rightarrow$  In each example, opposite angles are equal.

Conjecture  $\rightarrow$  Opposite angles of a parallelogram are equal.

Q.9. See ex. 4 (p. 10)