

Second Term Assignment Related to Geometry

ANGLES.

Exercise 1.2

Oral

1 a) ~~Find~~ From the given figure, find out the six pairs of adjacent angles and state their names using three letters.

→ (i) $\angle EDC$ is adjacent to $\angle ADE$

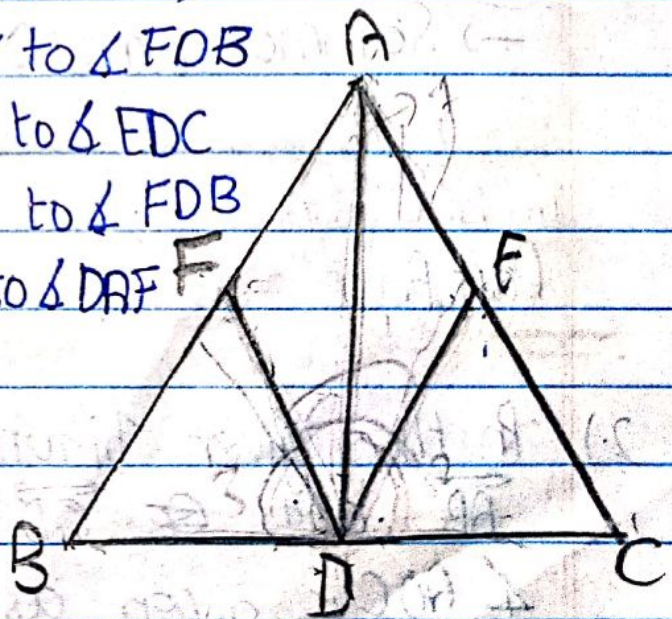
(ii) $\angle ADE$ is adjacent to $\angle ADF$

(iii) $\angle ADF$ is adjacent to $\angle FDB$

(iv) $\angle FDE$ is adjacent to $\angle EDC$

(v) $\angle EDF$ is adjacent to $\angle FDB$

(vi) $\angle EAD$ is adjacent to $\angle DAF$



→

PAGE No. _____

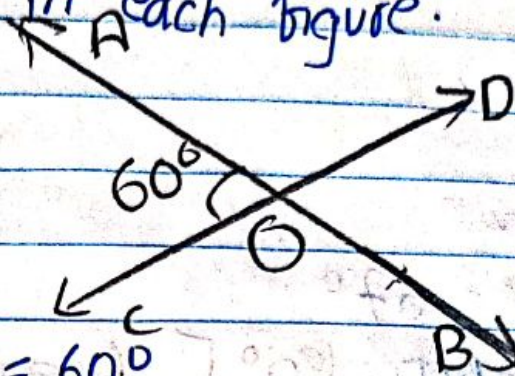
b) From the figure, state the linear pairs using three letters. Also, state the names of common arms for each linear pair.

-
- (i) $\angle ADC$ and $\angle ADB$
→ Common arm: $\overrightarrow{AD}$
 - (ii) $\angle FDB$ & $\angle FDC$
→ Common arm: $\overrightarrow{FD}$
 - (iii) $\angle EDC$ & $\angle EDB$
→ Common arm: $\overrightarrow{ED}$
 - (iv) ~~$\angle ADE$~~ & $\angle DEC$
 $\angle DEA$ → Common arm: $\overrightarrow{DE}$
 - (v) $\angle DFA$ & $\angle DFB$
→ Common arm: $\overrightarrow{DF}$
-

Part A

2.) In the given figures, the straight lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at O. $\angle AOC$ is given as indicated, find

the values of its adjacent angles $\angle BOC$ and $\angle AOD$ in each figure.



a)

→ Soln

Here,

① $\angle AOC = 60^\circ$

~~② $\angle AOC = \angle BOD = 60^\circ$ [∵ Vertically opposite angles]~~

③ ① $\angle AOC + \angle AOD = 180^\circ$ [∵ linear pair]
or, $60^\circ + \angle AOD = 180^\circ$

or, $\angle AOD = 180^\circ - 60^\circ$

∴ $\angle AOD = 120^\circ$

④ ∴ $\angle AOD = \angle BOC = 120^\circ$ [∵ vertically opposite angles]

b) → Soln

Here,

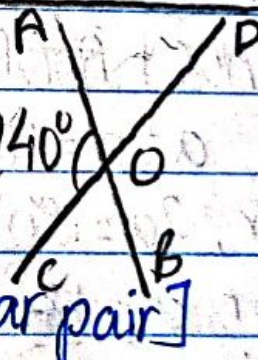
① $\angle AOC = 140^\circ$

② $\angle AOC + \angle AOD = 180^\circ$ [∵ linear pair]

or, $140^\circ + \angle AOD = 180^\circ$

or, $\angle AOD = 180^\circ - 140^\circ$

∴ $\angle AOD = 40^\circ$



(iii) $\therefore \angle AOD = \angle BOC = 40^\circ$ [$\therefore$ Vertically Opposite Angle]

c) $\rightarrow$ Solⁿ

Here,

(i) $\angle AOC = 167^\circ$

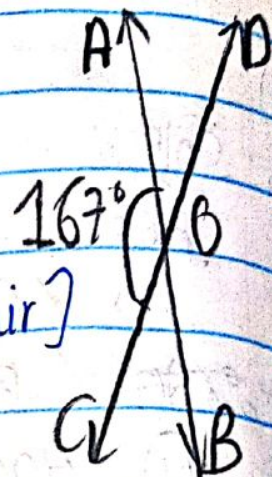
(ii) $\angle AOC + \angle AOD = 180^\circ$ [$\therefore$ linear pair]

or, $167^\circ + \angle AOD = 180^\circ$

or, $\angle AOD = 180^\circ - 167^\circ$

$\therefore \angle AOD = 13^\circ$

(iii) $\therefore \angle AOD = \angle BOC = 13^\circ$ [$\therefore$ Vertically Opposite Angle]



d) $\rightarrow$ Solⁿ

Here, Let $\angle BOD$ be a .

(i) $\angle AOC = a$

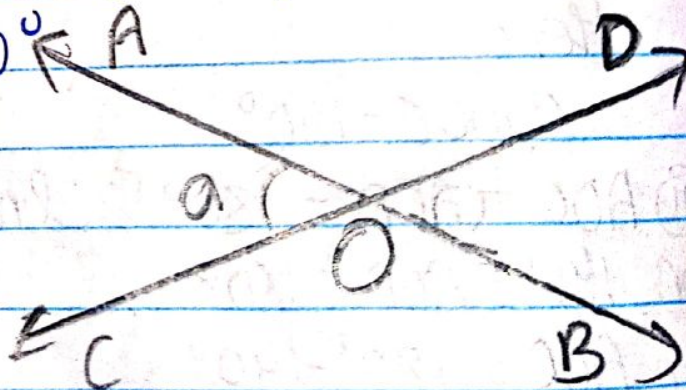
(ii) $\angle AOC + \angle BOD = 180^\circ$ [$\therefore$ VOA]

or, $a + a = 180^\circ$

or, $2a = 180^\circ$

or, $a = \frac{180^\circ}{2}$

$\therefore a = 90^\circ$



DATE _____
PAGE No. _____

$$(iii) \angle AOC + \angle AOD = 180^\circ [\because \text{linear pair}]$$

$$\text{or, } 90^\circ + \angle AOD = 180^\circ$$

$$\text{or, } \angle AOD = 180^\circ - 90^\circ$$

$$\therefore \angle AOD = 90^\circ$$

$$(iv) \angle AOD = \angle BOC = 90^\circ [\because \text{vertically opposite angle}]$$

3. In each figure in question 2, if $\angle AOC$ is as given, find all the angles.

a) $\angle AOC = 57^\circ$

→ Soln

Here,

$$(i) \angle AOC = 57^\circ$$

$$(ii) \angle AOC + \angle AOD = 180^\circ [\because \text{linear pair}]$$

$$\text{or, } 57^\circ + \angle AOD = 180^\circ$$

$$\text{or, } \angle AOD = 180^\circ - 57^\circ$$

$$\therefore \angle AOD = 123^\circ$$

$$(iii) \therefore \angle AOD = \angle BOC = 123^\circ [\because \text{vertically opposite angle}]$$

b) $\angle AOC = 153^\circ$

→ Solⁿ

Here,

(i) $\angle AOC = 153^\circ$

(ii) $\angle AOC + \angle AOD = 180^\circ$ [linear pair]

or, $153 + \angle AOD = 180^\circ$

or, $\angle AOD = (180 - 153)^\circ$

$\therefore \angle AOD = 27^\circ$

(iii) $\therefore \angle AOD = \angle BOC = 27^\circ$ [vertically opposite angle]

c) $\angle AOC = 165^\circ$

→ Solⁿ

Here,

(i) $\angle AOC = 165^\circ$

(ii) $\angle AOC + \angle AOD = 180^\circ$ [linear pair]

or, $165^\circ + \angle AOD = 180^\circ$

or, $\angle AOD = 180^\circ - 165^\circ$

$\therefore \angle AOD = 15^\circ$

(iii) $\therefore \angle AOD = \angle BOC = 15^\circ$ [vertically opposite angle]

d) $\angle AOC = 27^\circ$

→ Soln

Here,

(i) $\angle AOC = 27^\circ$

(ii) $\angle AOC + \angle AOD = 180^\circ$ [∵ linear pair]

or, $27^\circ + \angle AOD = 180^\circ$

or, $\angle AOD = 180^\circ - 27^\circ$

$\therefore \angle AOD = 153^\circ$

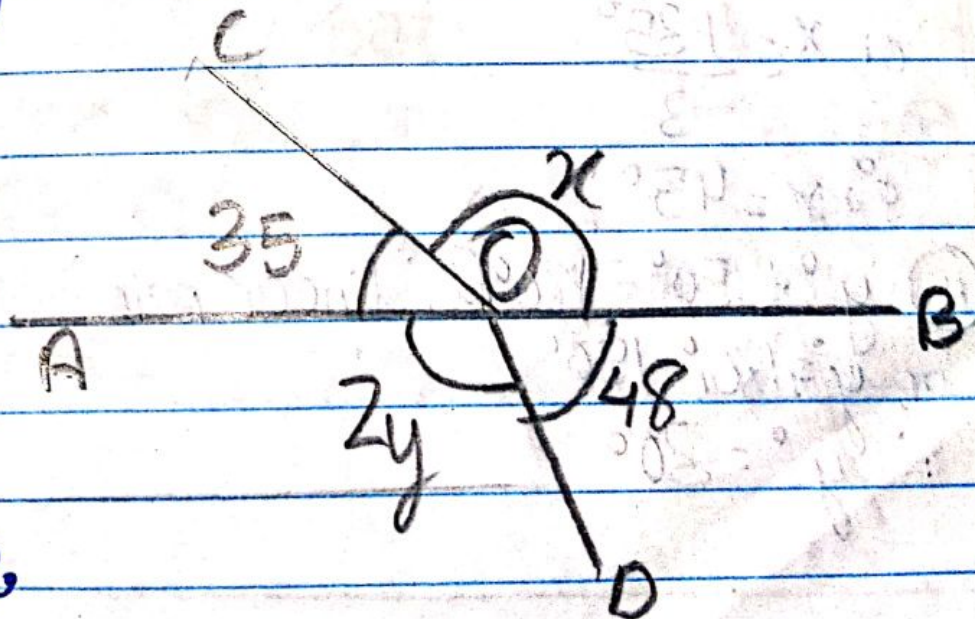
(iii) $\therefore \angle AOD = \angle BOC = 153^\circ$ [∵ Vertically Opposite Angles]

✍

Part B

4.) In each of the following figures, $\overleftrightarrow{AB}$ is a straight line, find the values of x and y .

(a)



→ Soln
Here,

① $2y + 48^\circ = 180^\circ$ [∵ linear pair]

or, $2y^\circ = 180^\circ - 48^\circ$

or, $2y^\circ = 132^\circ$

or, $y^\circ = \frac{132}{2} = 66$

∴ $y^\circ = 66^\circ$

② $x^\circ + 35^\circ = 180^\circ$ [∵ linear pair]

or, $x^\circ = 180^\circ - 35^\circ$

∴ $x^\circ = 145^\circ$

⑤

→ Solⁿ

Here,

① $3x + 45 = 180^\circ$ [∵ linear pair]

or, $3x = 180 - 45$

or, $3x = 135^\circ$

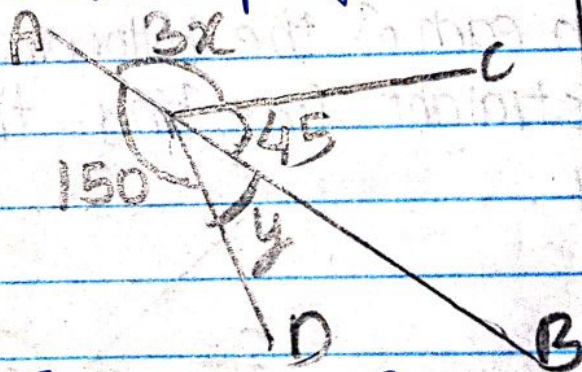
or, $x = \frac{135}{3}$

∴ $x = 45^\circ$

② $y^\circ + 150^\circ = 180^\circ$ [∵ linear pair]

or, $y^\circ = 180^\circ - 150^\circ$

∴ $y^\circ = 30^\circ$

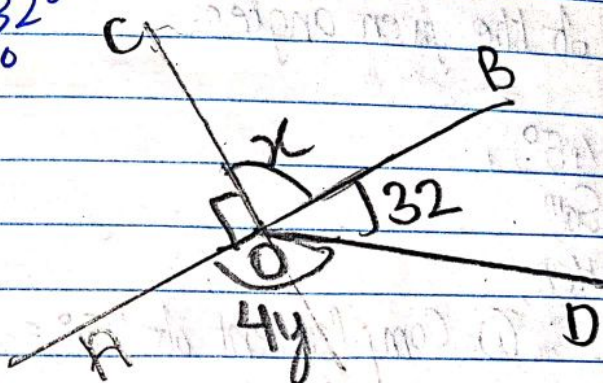


c) → Soln

Here,

$$\textcircled{i} \quad x^\circ + 90^\circ = 180^\circ \text{ [linear pair]} \\ \text{or, } x = 180^\circ - 90^\circ \\ \therefore x = 90^\circ$$

$$\textcircled{ii} \quad 4y^\circ + 32^\circ = 180^\circ \text{ [linear pair]} \\ \text{or, } 4y = 180^\circ - 32^\circ \\ \text{or, } 4y = 148^\circ \\ \text{or, } y = \frac{148^\circ}{4} \\ \therefore y = 37^\circ$$

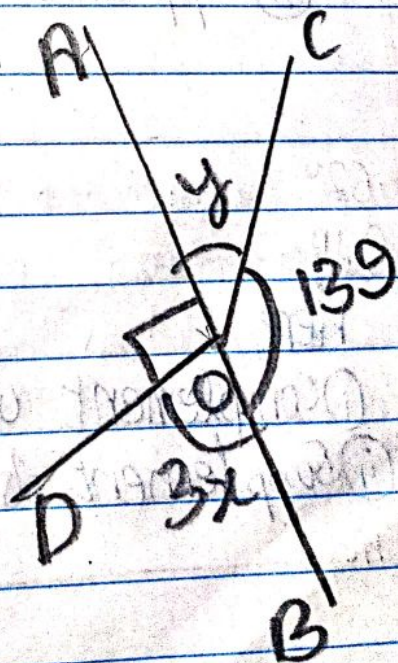


d)

→ Soln,

Here,

$$\textcircled{i} \quad 3x + 90^\circ = 180^\circ \text{ [linear pair]} \\ \text{or, } 3x = 180^\circ - 90^\circ \\ \text{or, } 3x = 90^\circ \\ \text{or, } x = \frac{90^\circ}{3} \\ \therefore x = 30^\circ$$



DATE _____
PAGE No. _____

$$\textcircled{ii} y^\circ + 139^\circ = 180^\circ \text{ [} \because \text{linear pair]} \\ \text{or, } y^\circ = 180^\circ - 139^\circ \\ \therefore y^\circ = 41^\circ$$

5.) Find the $\textcircled{i}$ complement and $\textcircled{ii}$ Supplement of the given angles.

a) 45°

→ Soln

Here,

$$\textcircled{i} \text{ Complement of } 45^\circ = 90^\circ - 45^\circ \\ = 45^\circ$$

$$\textcircled{ii} \text{ Supplement of } 45^\circ = 180^\circ - 45^\circ \\ = 135^\circ$$

b) 62°

→ Soln

Here,

$$\textcircled{i} \text{ Complement of } 62^\circ = 90^\circ - 62^\circ = 28^\circ$$

$$\textcircled{ii} \text{ Supplement of } 62^\circ = 180^\circ - 62^\circ = 118^\circ$$

c) 36°

→ Solⁿ Here,

① Complement of $36^\circ = 90^\circ - 36^\circ = 54^\circ$

② Supplement of $36^\circ = 180^\circ - 36^\circ = 144^\circ$

d) 78°

→ Solⁿ

Here,

① Complement of $78^\circ = 90^\circ - 78^\circ = 12^\circ$

② Supplement of $78^\circ = 180^\circ - 78^\circ = 102^\circ$

Part C

6a) The complement of an angle is 18° less than the double of itself. Find the angle.

→ Solⁿ Here,

Let the angle be x .

According to question.

~~$$2x = x = 2x - 18^\circ$$

$$\text{or, } 2x - 2x + x = -18^\circ$$

$$\text{or, } x = -18^\circ$$~~

$$(90 - x) = 2x - 18$$

$$\text{or, } 90 - x = 2x - 18$$

$$\text{or, } 90 + 18 = 2x + x$$

$$\text{or, } 3x = 108$$

$$\text{or, } x = \frac{108}{3}$$

$$\therefore x = 36^\circ$$

$\therefore$ The angle is 36° .

b) The complement of an angle is 40° more than four times itself. Find the supplementary angle.

→ Soln,
Here,

Let the angle be x .

According to the question,

$$(90-x)^\circ = 40^\circ + 4x$$

$$\text{or, } 90-x^\circ = 40^\circ + 4x$$

$$\text{or, } 90^\circ - 40^\circ = 4x + x$$

$$\text{or, } 5x = 50^\circ$$

$$\text{or, } x = \frac{50^\circ}{5}$$

$$\therefore x = 10^\circ$$

$\therefore$ The supplementary angle is: $180^\circ - 10^\circ = 170^\circ$

7. (a) The supplement of the double of complement of an angle is 120° .
Find the complement of the angle.

$\rightarrow$ Soln

Here, complementary

Let the angle be x .

According to the question,

$$180^\circ - 2(90^\circ - x) = 120^\circ$$

DATE _____
PAGE No. _____

$$\text{or, } 180^\circ - 180^\circ + 2x^\circ = 120^\circ$$

$$\text{or, } 2x = 120^\circ$$

$$\text{or, } x = \frac{120^\circ}{2}$$

$$\therefore x = 60^\circ$$

$\therefore$ The complementary angle is 60°

b) A triangle has one acute angle as the complement of the other. Find the third angle. [Hint: The sum of three angles is 180°]

→ Soln,

Here,

Let the third angle be x .

$$90^\circ + x^\circ = 180^\circ \text{ [} \because \text{sum of the angles of a triangle]}$$

$$\text{or, } x^\circ = 180^\circ - 90^\circ$$

$$\therefore x = 90^\circ$$

$\therefore$ The third angle is 90° .

Ex-1.3

Part A

1) Look at the adjoining figure and find the following angles.

a) Corresponding angle of $\angle CGH$,

$\rightarrow \angle AHF$

b) Alternate angle of $\angle AHG$,

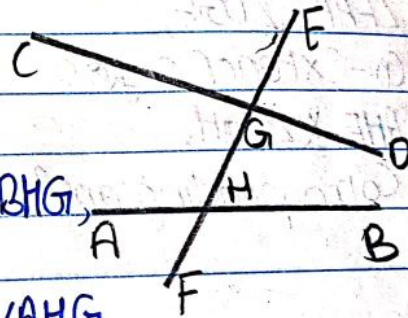
$\rightarrow \angle DGH$

c) Co-interior angle of $\angle BHG$,

$\rightarrow \angle DGH$

d) Corresponding angle of $\angle AHG$,

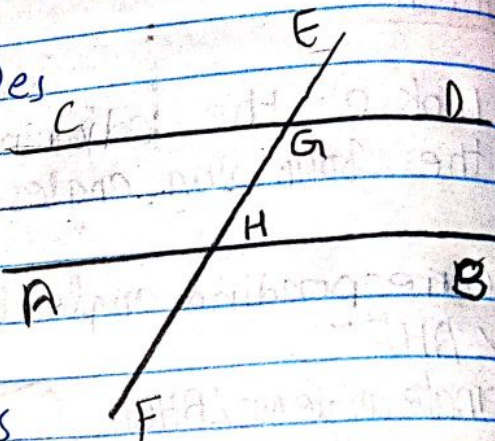
$\rightarrow \angle CGE$



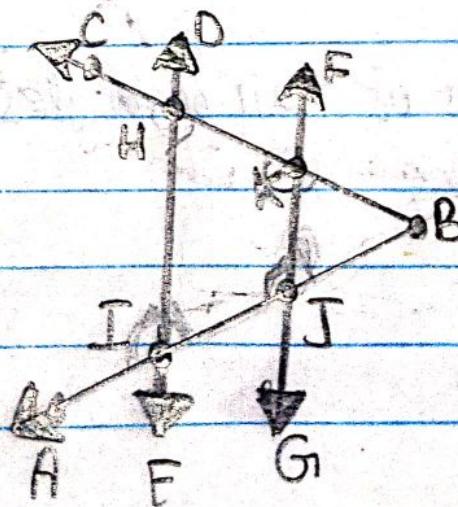
2) Part B

2) State the type of pair of angles in each of the following:

- a) $\angle HGD$ & $\angle FHB$,
→ Corresponding angles
- b) $\angle EGD$ & $\angle GHB$,
→ Corresponding angles
- c) $\angle AHG$ & $\angle HGD$,
→ Alternate angles
- d) $\angle HGD$ & $\angle GHB$,
→ Co-interior angles
- e) $\angle FHB$ & $\angle DGE$,
→ Co-exterior angles
- f) $\angle AHE$ & $\angle CGH$,
→ Corresponding angles.



3. Look at the given figure and fill in the table by copying it in your exercise book.



	Given angle (X)	Related angles (Y)		
		Alternate	Corresponding	Co-interior
i)	∠HKE ∠HKJ	∠BJK	∠CHI	∠KHI
ii)	∠KHI	∠HIA	∠BKJ	∠HKJ
iii)	∠HIJ	∠CHI	∠BJK	∠ KHI IJK
iv)	∠IJK	∠JKB	∠HIA	∠HIJ

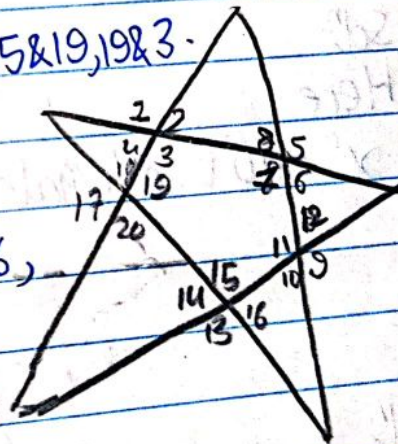
Part C

4. Look at the adjoining figure and write down the type of pair of angles in each of the following:

a) Angles no. 3 & 7, 7 & 11, 11 & 15, 15 & 19, 19 & 3.
→ Co-interior angles

b) Angles no. 3 & 8, 7 & 12, 11 & 16,
15 & 20, 19 & 4

→ Alternate angles



c) Angles no. ~~3 & 8, 7 & 12, 11 & 16~~ 4 & 7, 7 & 10, 11 & 14, 15 & 18,
19 & 2 → Corresponding angles

d) Angles no. 1 & 3, 4 & 12, 7 & 19, 10 & 12.
→ Vertically Opposite Angles

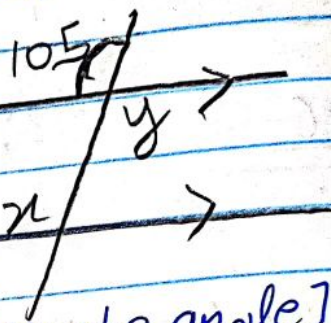
5. From the given figures, find the values of x & y .

a)

→ Soln, Here,

(i) $y^\circ = 105^\circ$ [VOA]

(ii) $y^\circ = x^\circ = 105^\circ$ [Alternate angle]

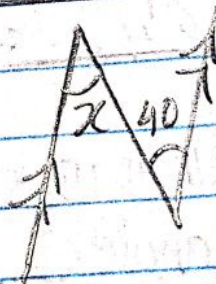


b)

→ Soln,

Here,

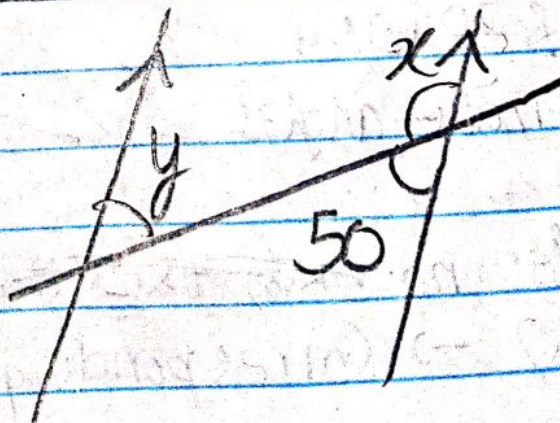
$x^\circ = 40^\circ$ [alternate angle]



c)

→ Soln,

Here,



① $y^\circ = 50^\circ$ [∵ alternate angle]

② $x^\circ + y^\circ = 180^\circ$ [∵ co-interior angle]

or, $x^\circ + 50^\circ = 180^\circ$

or, $x^\circ = 180^\circ - 50^\circ$

∴ $x^\circ = 130^\circ$

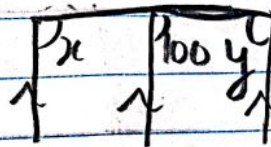
d)

→ Soln

Here,

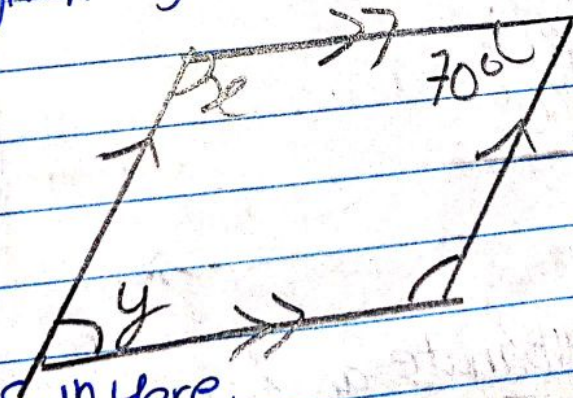
$x^\circ = 100^\circ$ [∵ corresponding angle]

$y + 100 = 180^\circ$ [∵ co-interior angle] ∴ $y = 80^\circ$



6.) Find the values of a and b from the given figures.

a)



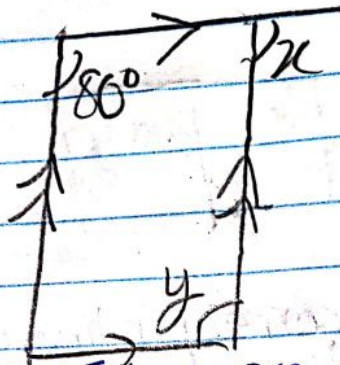
→ Soln, Here,

① $x + 70^\circ = 180^\circ$ [∵ co-interior angle]

or, $x = 180^\circ - 70^\circ$ ∴ $x = 110^\circ$

(ii) $y^\circ + x^\circ = 180^\circ$ [∵ co-interior angle]
 or, $y^\circ + 110^\circ = 180^\circ$
 or, $y^\circ = 180^\circ - 110^\circ$
 $\therefore y^\circ = 70^\circ$

(b)

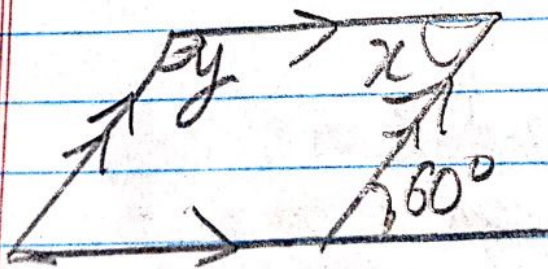


→ Soln

Here,

$\therefore x^\circ = 80^\circ$ [∵ corresponding angle]
 $\therefore y^\circ = x^\circ = 80^\circ$ [∵ alternate angle]

(c)



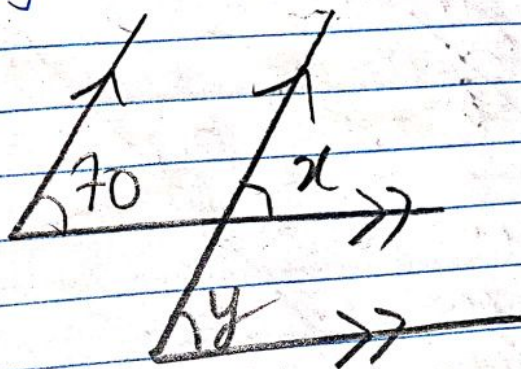
→ Soln Here,

(i) $x^\circ = 60^\circ$ [∵ alternate angle]
 (ii) $x^\circ + y^\circ = 180^\circ$ [∵ co-interior angle]

or, $60^\circ + y^\circ = 180^\circ$
 or, $y^\circ = 180^\circ - 60^\circ$
 $\therefore y^\circ = 120^\circ$

7) Find the values of x & y from the given figures.

a)

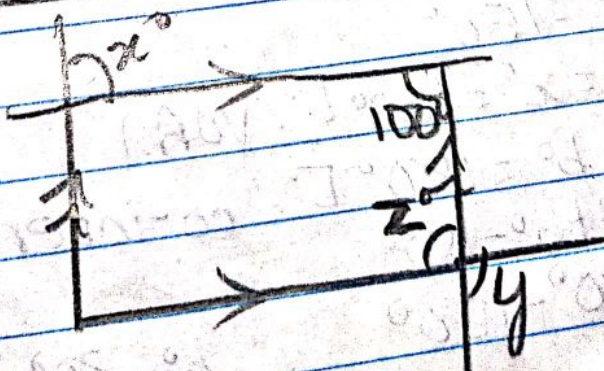


→ Soln

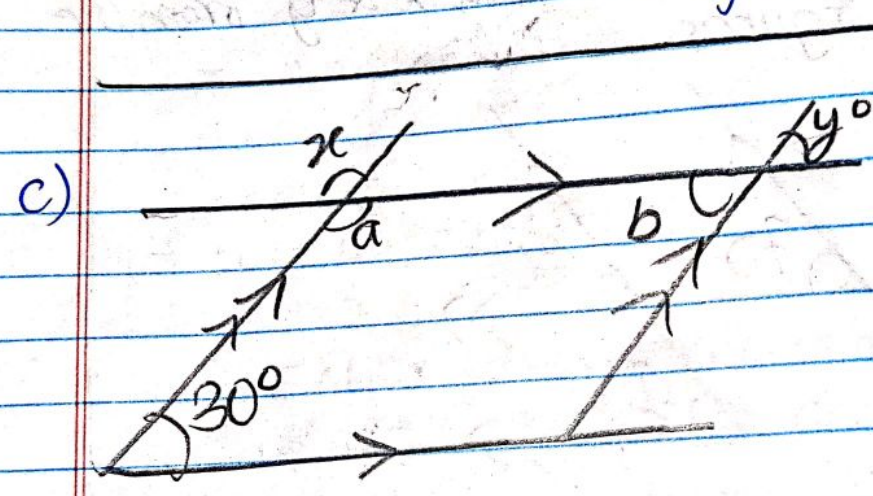
Here,

$\therefore x^\circ = 70^\circ$ [corresponding angle]
 $\therefore x^\circ = y^\circ = 70^\circ$ [corresponding angle]

b)



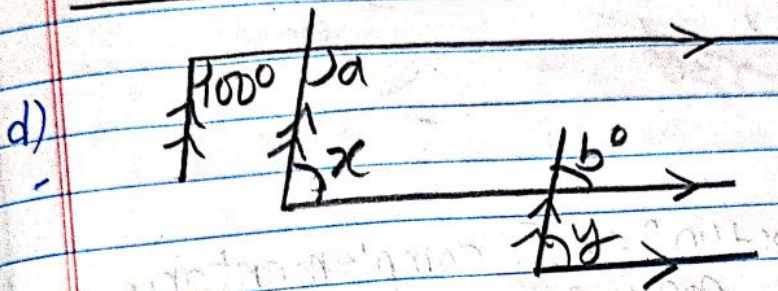
- ① $x^\circ = 100^\circ$ [∵ alternate angle]
 ② $100^\circ + z^\circ = 180^\circ$ [∵ co-interior angle]
 or, $z^\circ = 180^\circ - 100^\circ$
 $\therefore z^\circ = 80^\circ$
 ③ $\therefore z^\circ = y^\circ = 80^\circ$ [∵ Vertically Opposite Angle]



- Soln
 Here,
 ① $30^\circ + a^\circ = 180^\circ$ [∵ co-interior angle]
 or, $a^\circ = 180^\circ - 30^\circ$
 $\therefore a^\circ = 150^\circ$
 ② $\therefore a^\circ = x^\circ = 150^\circ$ [∵ vOA]
 ③ $a^\circ + b^\circ = 180^\circ$ [∵ co-interior angle]
 or, $150^\circ + b^\circ = 180^\circ$
 or, $b = 180^\circ - 150^\circ \therefore b^\circ = 30^\circ$

DATE _____
PAGE No. _____

(iv) $\therefore b^\circ = y^\circ = 30^\circ$ [vertically opposite angle]



→ Sol, Here,

- (i) $\therefore x^\circ = 100^\circ$ [alternate angle]
 (ii) $\therefore x^\circ = a^\circ = 100^\circ$ [corresponding angle]
 (iii) $\therefore a^\circ - y^\circ = 100^\circ$ [corresponding angle]

(i) $\therefore a^\circ = 100^\circ$ [corresponding angle]

(ii) $a^\circ + x^\circ = 180^\circ$ [co-interior angle]

or, $100^\circ + x^\circ = 180^\circ$

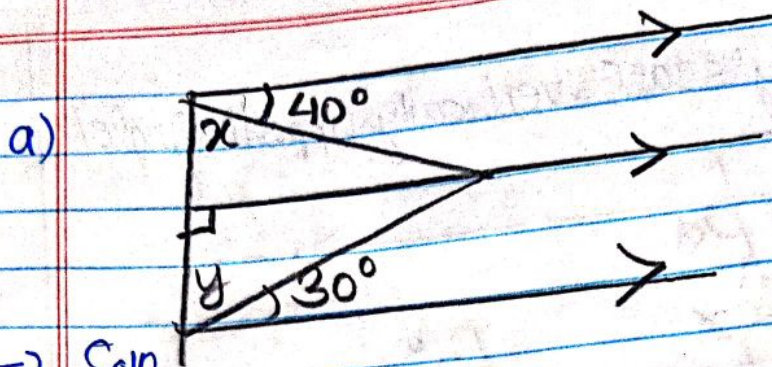
or, $x^\circ = 180^\circ - 100^\circ$

$\therefore x^\circ = 80^\circ$

(iii) $\therefore x^\circ = b^\circ = 80^\circ$ [corresponding angle]

(iv) $\therefore b^\circ = y^\circ = 80^\circ$ [corresponding angle]

8. From the given, find the value of x & y :



→ Soln

Here,

- $x + 40^\circ = 90^\circ$ [complementary angle]

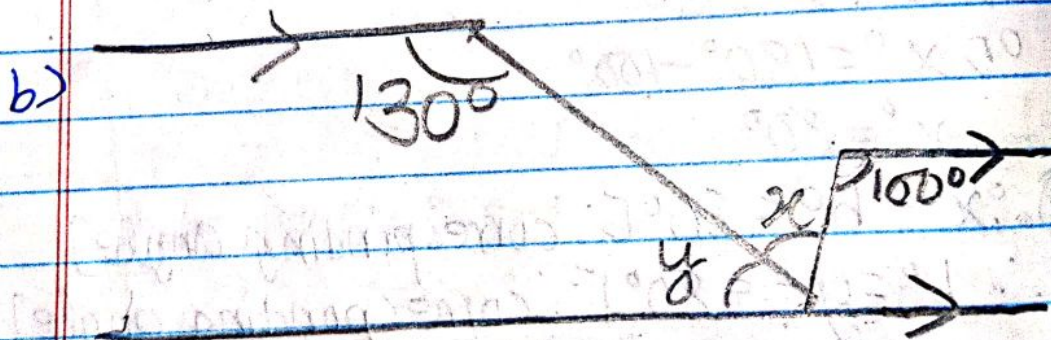
or, $x^\circ = 90^\circ - 40^\circ$

$\therefore x^\circ = 50^\circ$

- $y^\circ + 30^\circ = 90^\circ$ [complementary angle]

or, $y^\circ = 90^\circ - 30^\circ$

$\therefore y^\circ = 60^\circ$

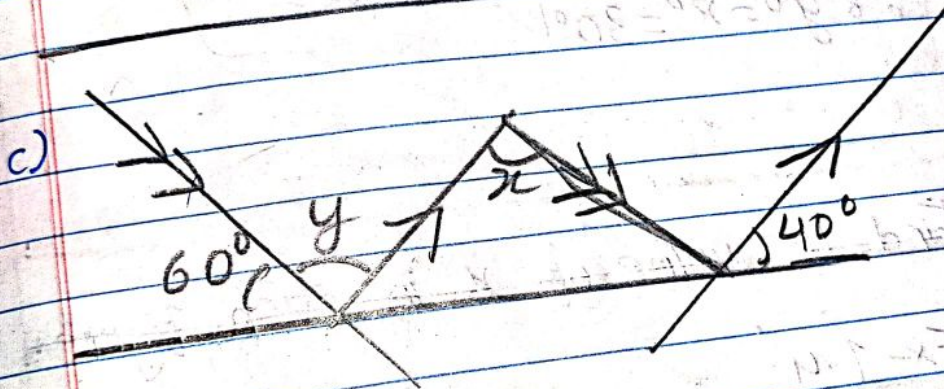


→ Soln

Here,

$- 130^\circ + y^\circ = 180^\circ$ [$\because$ co-interior angle]
 or, $y^\circ = 180^\circ - 130^\circ$
 $\therefore y^\circ = 50^\circ$

$\therefore x^\circ + y^\circ = 100^\circ$ [alternate angle]
 or, $x^\circ + 50^\circ = 100^\circ$
 or, $x^\circ = 100^\circ - 50^\circ$
 $\therefore x^\circ = 50^\circ$



$\rightarrow$ Soln

Here,

$\textcircled{1} z^\circ = 40^\circ$ [corresponding angle]
 $\textcircled{11} 60^\circ + z^\circ + y^\circ = 180^\circ$ [parts of straight angle]

or, $60^\circ + 40^\circ + y^\circ = 180^\circ$

or, $100^\circ + y^\circ = 180^\circ$

or, $y^\circ = 180^\circ - 100^\circ \therefore y^\circ = 80^\circ$

$\therefore y^\circ = x^\circ = 80^\circ$ (alternate angle)

d) $\rightarrow$ Soln,
Here,



$\therefore z^\circ = 30^\circ$
 $\therefore x^\circ = z^\circ = 30^\circ$
 $\therefore y^\circ = x^\circ = 30^\circ$ [alternate angle]

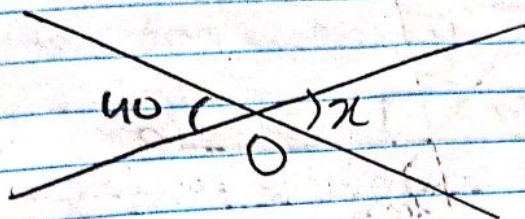
2. Find the value of x in each figure.

Ex-1.4

Part A

1) In the given figures, two straight lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at the point O and have four angles. Find the values of x and y .

a)

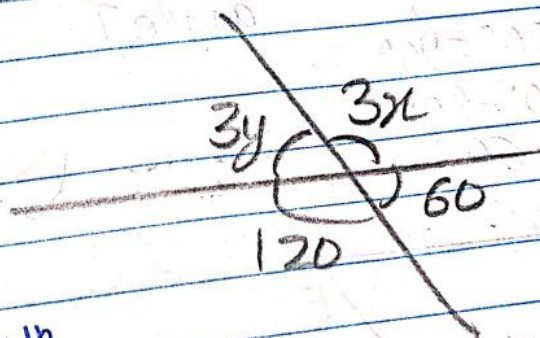


→ Soln

Here,

$$x^\circ = 40^\circ \text{ [} \because \text{Vertically Opposite Angle]}$$

b)



→ Soln

Here,

$$\textcircled{i} \quad 2y = 60^\circ \text{ [} \because \text{Vertically Opposite Angle]}$$

$$\text{or, } y^\circ = \frac{60}{2} = 30^\circ$$

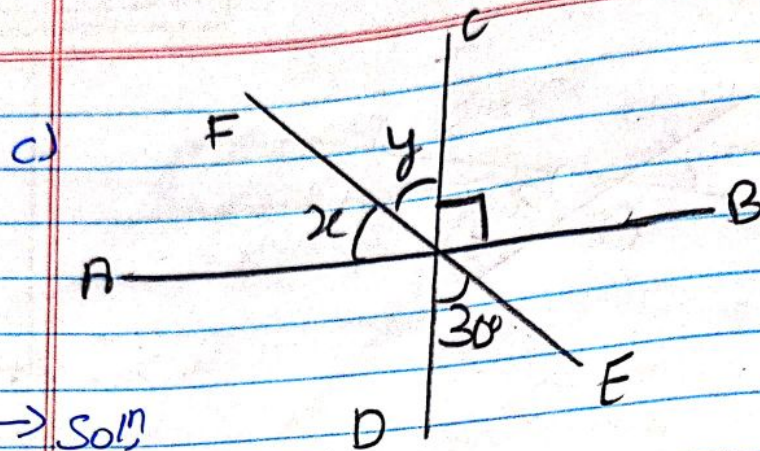
$$\therefore y^\circ = 30^\circ$$

$$\textcircled{ii} \quad 3x = 120^\circ \text{ [} \because \text{Vertically Opposite Angle]}$$

$$\text{or, } x = \frac{120^\circ}{3} = 40^\circ$$

$$\therefore x^\circ = 40^\circ$$

t lines
he point
nd the



→ Solⁿ

Here,

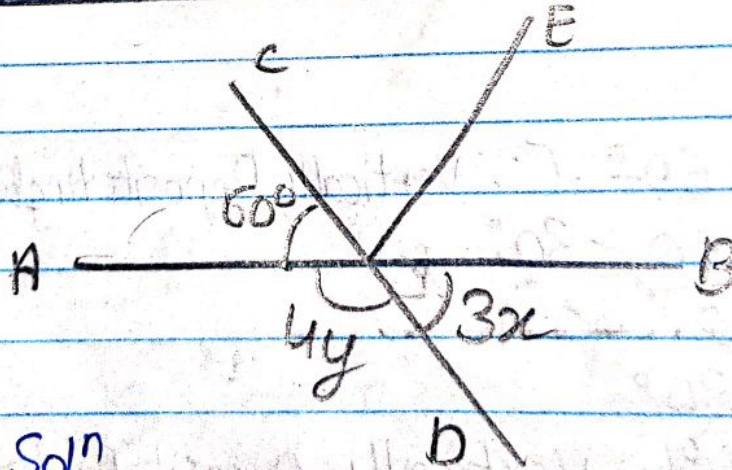
- (i) $\therefore y^\circ = 30^\circ$ [∵ VOA]
(ii) $x^\circ + y^\circ = 90^\circ$ [∵ complementary angle]

$$\text{or, } x^\circ + 30^\circ = 90^\circ$$

$$\text{or, } x^\circ = 90^\circ - 30^\circ$$

$$\therefore x^\circ = 60^\circ$$

d)



→ Solⁿ

Here,

(i) $3x^\circ = 60^\circ$ [$\because$ vOA]

or, $x = \frac{60^\circ}{3}$

$\therefore x^\circ = 20^\circ$

(ii) $4y^\circ + 3x^\circ = 180^\circ$ [$\because$ linear pair]

or, $4y^\circ + 60^\circ = 180^\circ$

or, $4y^\circ = 180^\circ - 60^\circ$

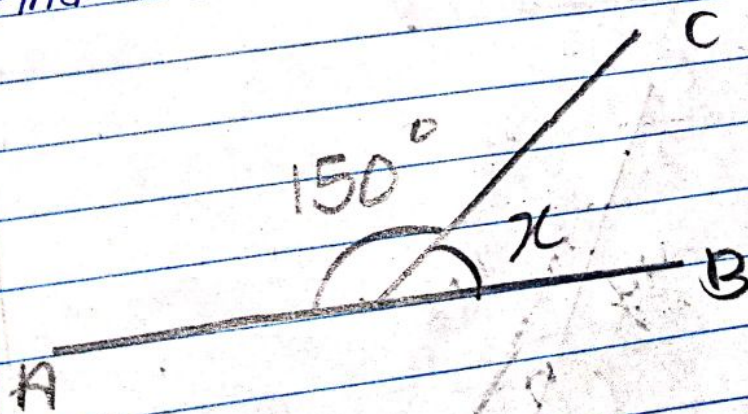
or, $4y^\circ = 120^\circ$

or, $y^\circ = \frac{120^\circ}{4}$

$\therefore y^\circ = 30^\circ$

2. Find the value of x in each figure:

a)



$\rightarrow$ Soln

Here,

$$x^\circ + 150^\circ = 180^\circ \text{ [}\therefore \text{linear pair]}$$

$$\text{or, } x^\circ = 180^\circ - 150^\circ$$

$$\therefore x^\circ = 30^\circ$$

(b) $\rightarrow$ Soln
Here,

$$2x + 70^\circ + 80^\circ = 180^\circ \text{ [}\therefore \text{straight angle]}$$

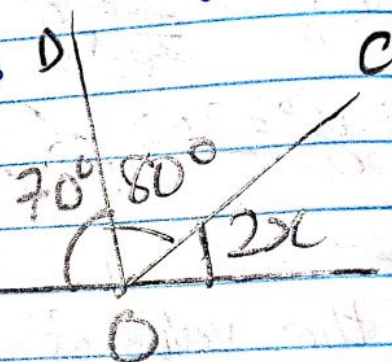
$$\text{or, } 2x + 150^\circ = 180^\circ$$

$$\text{or, } 2x^\circ = 180^\circ - 150^\circ$$

$$\text{or, } 2x^\circ = 30^\circ$$

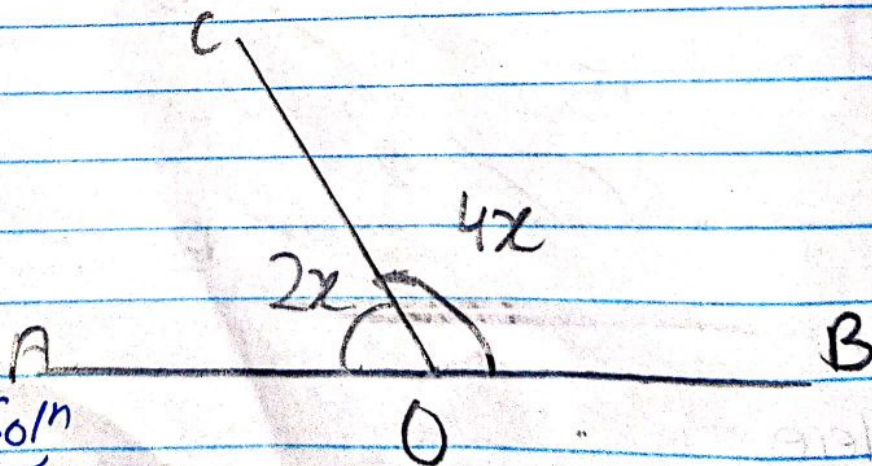
$$\text{or, } x = \frac{30^\circ}{2}$$

$$\therefore x = 15^\circ$$



(c)

$\rightarrow$ Soln
Here,



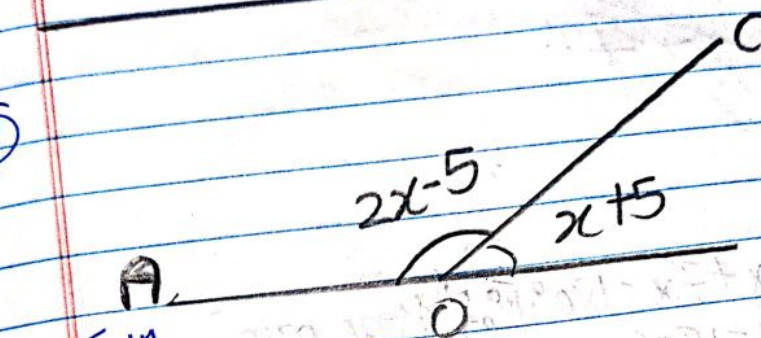
$$2x + 4x = 180^\circ \text{ (: linear pair)}$$

$$\text{or, } 6x = 180^\circ$$

$$\text{or, } x = \frac{180}{6}$$

$$\therefore x = 30^\circ$$

②



→ Soln

Here,

$$(2x-5) + (x+5) = 180^\circ \text{ (: linear pair)}$$

$$\text{or, } 2x-5 + x+5 = 180^\circ$$

$$\text{or, } 3x = 180^\circ$$

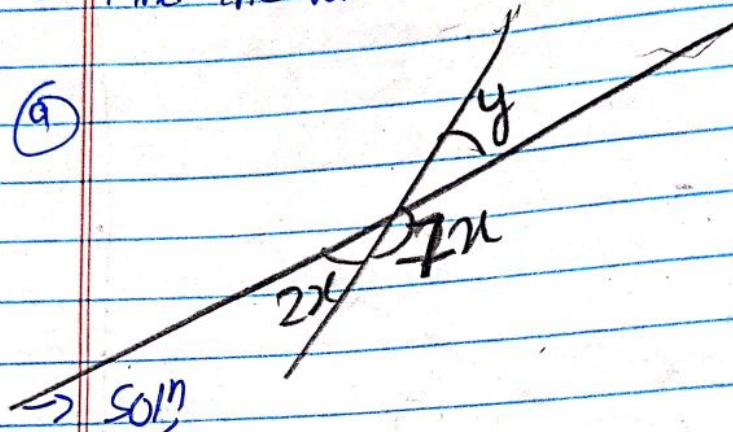
$$\text{or, } x = \frac{180}{3}$$

$$\therefore x = 60^\circ$$

Part B

3. Find the value of x in each figure:

(a)



Here,

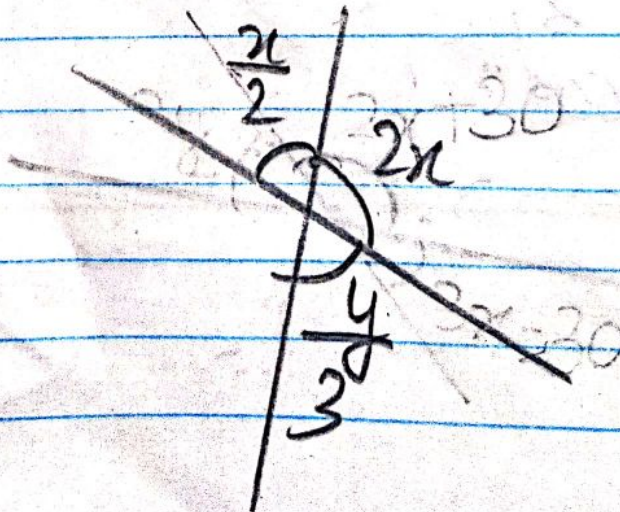
$$2x + 7x = 180^\circ \text{ [}\because \text{linear pair]}$$

$$\text{or, } 9x = 180^\circ$$

$$\text{or, } x = \frac{180^\circ}{9}$$

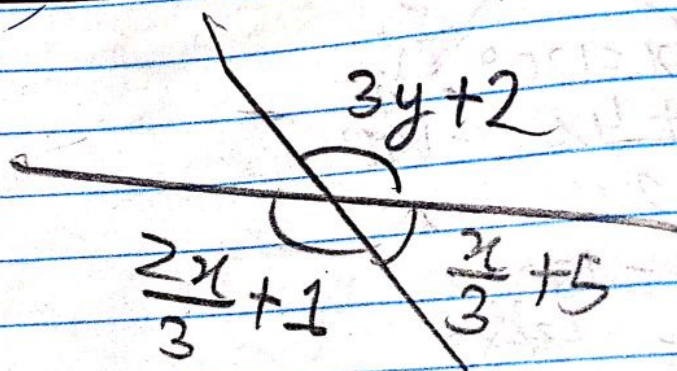
$$\therefore x = 20^\circ$$

(b)



$$(2x+30) + (3x-30) = 180^\circ \text{ [}\because \text{linear pair]} \\ \text{or, } 2x + \cancel{30} + 3x - \cancel{30} = 180^\circ \\ \text{or, } 5x = 180^\circ \\ \text{or, } x = \frac{180^\circ}{5} \\ \therefore x^\circ = 36^\circ$$

d)



→ Soln

Here,

$$\left(\frac{2x}{3} + 1\right) + \left(\frac{x}{3} + 5\right) = 180^\circ \text{ [}\because \text{linear pair]}$$

$$\text{or, } \frac{2x}{3} + 1 + \frac{x}{3} + 5 = 180^\circ$$

$$\text{or, } \frac{2x+x}{3} + 6 = 180^\circ$$

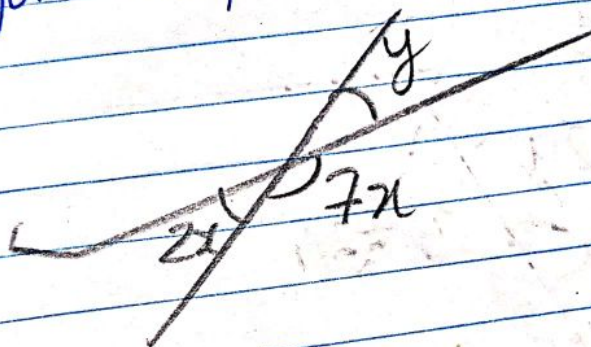
$$\text{or, } \frac{3x}{3} = 180^\circ - 6^\circ$$

or, $3x = 174$

$\therefore x = 174^\circ$

4. Find the value of y in each of the figures in question (3).

a)



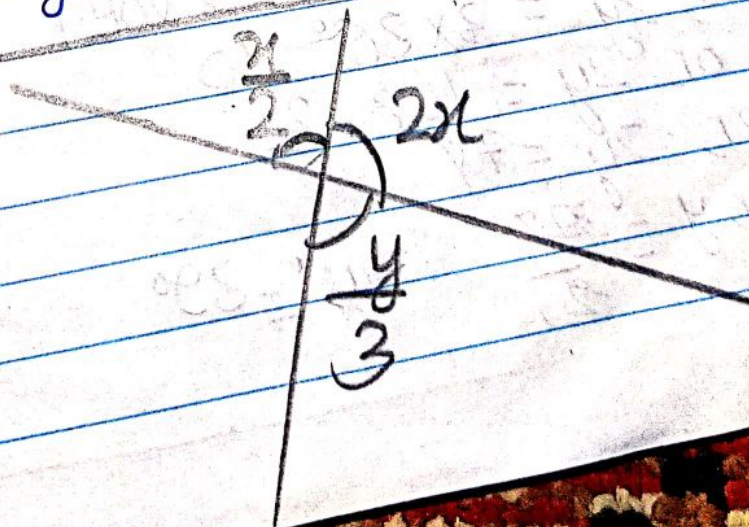
$\rightarrow$ Soln

Here,

$\therefore y = 2x = 2 \times 20 = 40^\circ$ [$\because$ ~~vertic~~ VOA]

$\therefore y^\circ = 40^\circ$

b)



→ Soln

Here,

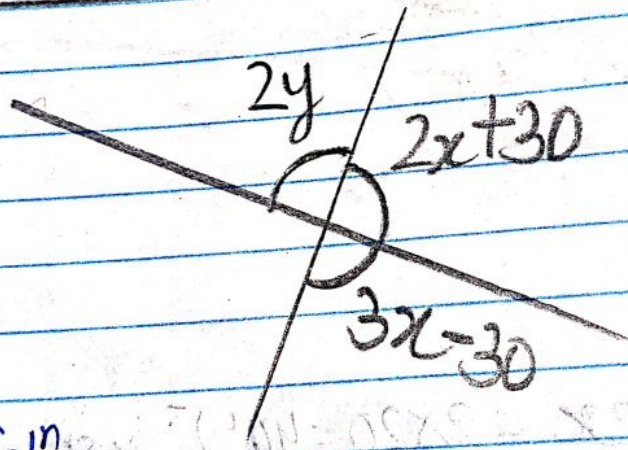
$$\frac{x}{2} = \frac{y}{3} [\because \text{VOA}]$$

$$\text{or, } 2y = 3 \times 72$$

$$\text{or, } y = \frac{3 \times 72}{2}$$

$$\therefore y = 108^\circ$$

c)



→ Soln

Here,

$$\textcircled{1} 2y = 3x - 30 [\because \text{VOA}]$$

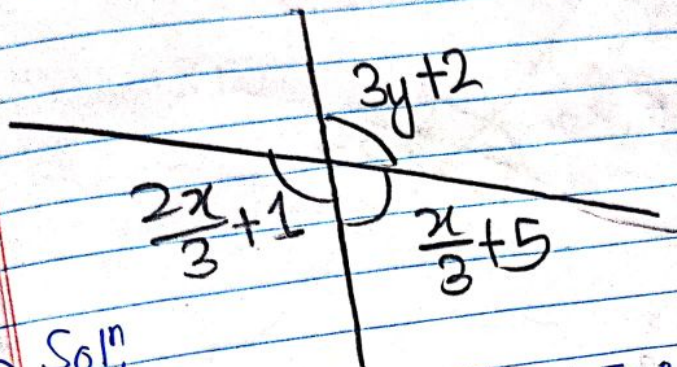
$$\text{or, } 2y = 3 \times 36^\circ - 30$$

$$\text{or, } 2y = 108 - 30$$

$$\text{or, } 2y = 78$$

$$\text{or, } y = \frac{78}{2} \therefore y^\circ = 39^\circ$$

d)



→ Solⁿ

Here,

$$3y+2 = 2x+1 \quad [\because \text{V.O.A}]$$

$$\text{or, } 3y+2 = \frac{2x+58}{3} + 1$$

$$\text{or, } 3y+2 = \frac{2 \times 58 + 1}{3}$$

$$\text{or, } 3y = 116 + 1 - 2$$

$$\text{or, } 3y = 115$$

$$\text{or, } 3y = 115$$

$$\text{or, } y = \frac{115}{3}$$

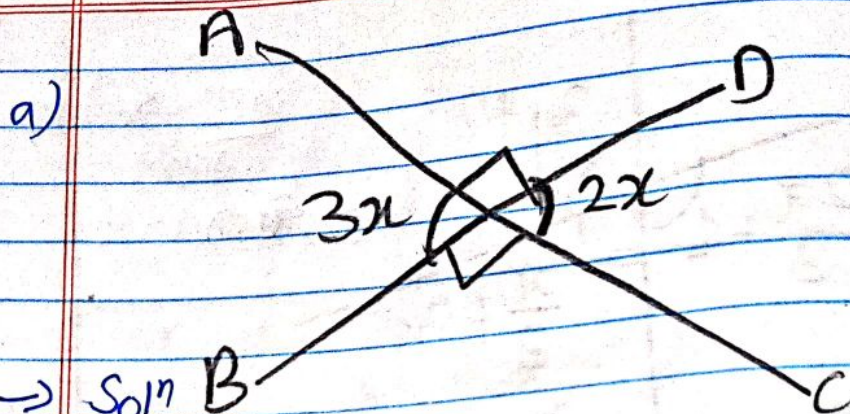
$$\therefore y^\circ = 38.3^\circ$$

$$\begin{array}{r} 3 \overline{) 174} 58 \\ - 151 \\ \hline 24 \\ - 24 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 3 \overline{) 115} 38.3 \\ - 91 \\ \hline 25 \\ - 24 \\ \hline 10 \\ - 9 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 10 \\ 6 \overline{) 08} \\ - 30 \\ \hline 78 \end{array}$$

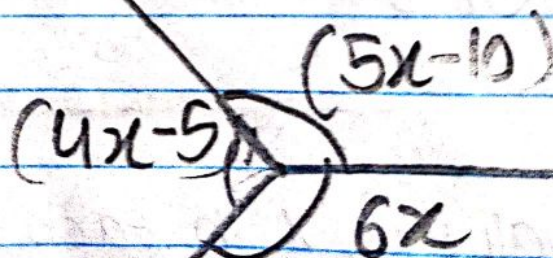
5. Find the value of x in each figure.



→ Soln
Here,

$$\begin{aligned}
 & \cancel{3x = 2x} \\
 & \text{or, } 3x + 2x + 90^\circ + 90^\circ = 360^\circ \quad [\because \text{complete turn}] \\
 & \text{or, } 5x + 180^\circ = 360^\circ \\
 & \text{or, } 5x = 360^\circ - 180^\circ \\
 & \text{or, } 5x = 180^\circ \\
 & \text{or, } x = \frac{180^\circ}{5} \\
 & \therefore x = 36^\circ
 \end{aligned}$$

b)



→ Soln

Here,

$$4x - 5 + 5x - 10 + 6x = 360^\circ \text{ [complete turn]}$$

$$\text{or, } 15x - 15 = 360^\circ$$

$$\text{or, } 15x = 360 + 15^\circ$$

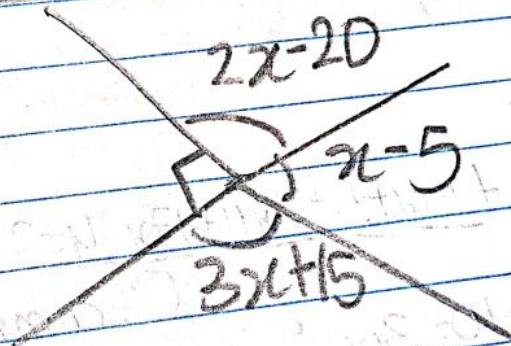
$$\text{or, } 15x = 375^\circ$$

$$\text{or, } x = \frac{375^\circ}{15}$$

$$\therefore x = 25^\circ$$

$$\begin{array}{r} 2 \\ 25 \\ \times 15 \\ \hline 125 \\ 250 \\ \hline 375 \end{array}$$

c)



→ Soln Here,

$$2x - 20 + x - 5 + 3x + 15 + 90^\circ = 360^\circ \text{ [complete turn]}$$

$$\text{or, } 6x + 105^\circ - 25^\circ = 360^\circ$$

$$\text{or, } 6x + 80^\circ = 360^\circ$$

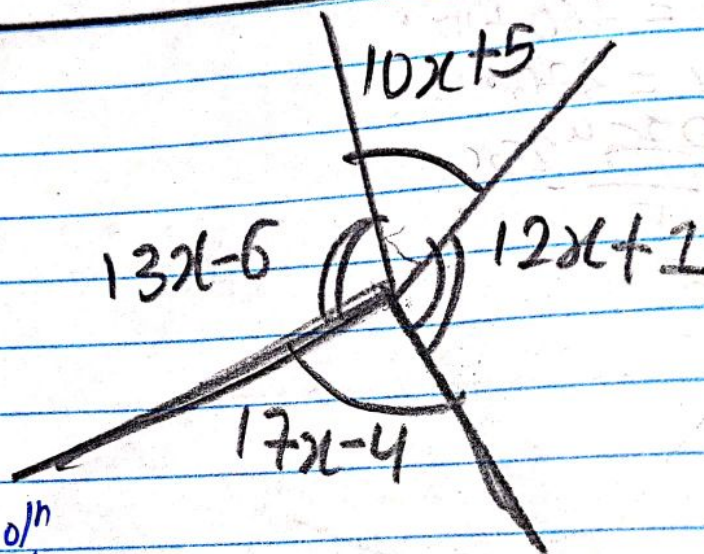
$$\text{or, } 6x = 360 - 80^\circ$$

$$\text{or, } 6x = 280^\circ$$

$$\text{or, } x = \frac{280}{6}$$

$$\therefore x = 46.6^\circ$$

d)



→ Soln

Here,

$$\underline{13x-6} + \underline{10x+5} + \underline{12x+1} + \underline{17x-4} = 360^\circ$$

[∵ complete turn]

$$\text{or, } 52x + 6 - 10 = 360^\circ$$

$$\text{or, } 52x = 360^\circ + 4^\circ$$

$$\text{or, } 52x = 364^\circ$$

$$\text{or, } x = \frac{364^\circ}{52}$$

$$\therefore x = 7^\circ$$