

\* Choose The Right Answer From The Given Options.

[26]

1. A protractor is used to draw and measure

- (A) angles (B) line segments (C) triangle (D) none of these

Ans. : A. angles

2. Which of the following angles is the measure of an obtuse angle?

- (A)  $60^\circ$  (B)  $120^\circ$  (C)  $90^\circ$  (D)  $30^\circ$

Ans. : B.  $120^\circ$

3. Which of the following angles is the measure of an acute angle?

- (A)  $30^\circ$  (B)  $90^\circ$  (C)  $120^\circ$  (D)  $240^\circ$

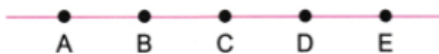
Ans. : A.  $30^\circ$

4. The angle measure for one complete revolution is

- (A)  $180^\circ$  (B)  $360^\circ$  (C)  $90^\circ$  (D) none of these

Ans. : B.  $360^\circ$

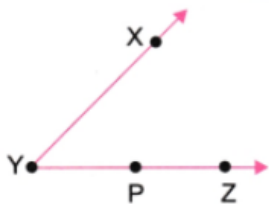
5. The number of line segments in the given figure is



- (A) 5 (B) 10 (C) 15 (D) 20

Ans. : B. 10

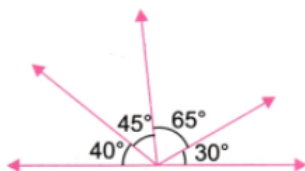
6. In the given figure,  $\angle XYZ$  cannot be written as



- (A)  $\angle Y$  (B)  $\angle ZYX$  (C)  $\angle ZXY$  (D)  $\angle XYP$

Ans. : C.  $\angle ZXY$

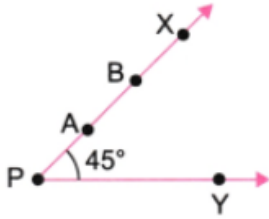
7. The number of obtuse angles in the given figure is



- (A) 2 (B) 3 (C) 4 (D) 5

Ans. : C. 4

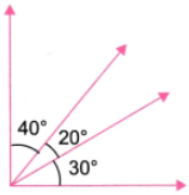
8. In the given figure, if point A is shifted to point B along the ray PX such that  $PB = 2 PA$ , then the measure of  $\angle BPY$  is



- (A) greater than  $45^\circ$     (B)  $45^\circ$     (C) less than  $45^\circ$     (D)  $90^\circ$

**Ans. :** B.  $45^\circ$

9. The number of angles in the given figure is



- (A) 3    (B) 4    (C) 5    (D) 6

**Ans. :** D. 6

10. The measure of a straight angle is

- (A)  $90^\circ$     (B)  $45^\circ$     (C)  $180^\circ$     (D)  $60^\circ$

**Ans. :** C.  $180^\circ$

11. The measure of an obtuse angle is

- (A)  $< 90^\circ$     (B)  $> 90^\circ$     (C)  $= 90^\circ$     (D) none of these

**Ans. :** B.  $> 90^\circ$

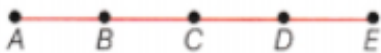
12. How many points are marked in the following figure?



- (A) 1    (B) 2    (C) 3    (D) 4

**Ans. :** D. 4

13. Number of line segments in following figure is



- (A) 5    (B) 10    (C) 15    (D) 20

**Ans. :** B. 10

14. Which of the following has two end points?

- (A) Ray    (B) Line    (C) Line segment    (D) None of these

**Ans. :** C. Line segment

15. A line segment has two end points and a line has \_\_\_\_\_ end points.

(A) 1

(B) 2

(C) Zero

(D) None of these

**Ans. : C. Zero**

16. Number of lines which can be drawn from one point is

(A) 1

(B) 2

(C) infinite

(D) 5

**Ans. : C. infinite**

17. In the given figure,  $\angle XYZ$  cannot be written as



(A)  $\angle Y$

(B)  $\angle ZXY$

(C)  $\angle ZYX$

(D)  $\angle XYP$

**Ans. : B.  $\angle ZXY$**

18. Measures of the two angles between hour and minute hands of a clock at 9 O' clock are

(A)  $60^\circ, 300^\circ$

(B)  $270^\circ, 90^\circ$

(C)  $75^\circ, 285^\circ$

(D)  $30^\circ, 330^\circ$

**Ans. : B.  $270^\circ, 90^\circ$**

19. If a bicycle wheel had 48 spokes, then the angle between a pair of two consecutive spokes is

(A)  $(5\frac{1}{2})^\circ$

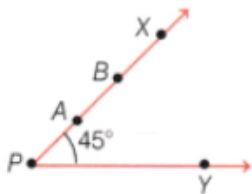
(B)  $(7\frac{1}{2})^\circ$

(C)  $(\frac{2}{11})^\circ$

(D)  $(\frac{2}{15})^\circ$

**Ans. : B.  $(7\frac{1}{2})^\circ$**

20. In figure, if point A is shifted to point B along the ray PX such that  $PB = 2PA$ , then the measure of  $\angle BPY$  is



(A) greater than  $45^\circ$

(B)  $45^\circ$

(C) less than  $45^\circ$

(D)  $90^\circ$

**Ans. : B.  $45^\circ$**

21. Where will the hand of a clock stop if it starts at 5 and makes  $\frac{1}{4}$  of a revolution clockwise?

(A) 7

(B) 8

(C) 9

(D) 10

**Ans. : B. 8**

22. If you are facing South and turn through a straight angle in which direction will you face now?

(A) South

(B) North

(C) East

(D) West

**Ans. : B. North**

23. How is the measure of an angle expressed?

- (A) Protractor                      (B) Compasses                      (C) Degrees                      (D) Centimetres

**Ans. : C. Degrees**

24. If the sum of two angles is greater than  $180^\circ$  then which of the following is not possible for the two angles? Competency Based Question

- (A) One obtuse angle and one acute angle  
(B) One reflex angle and one acute angle  
(C) Two obtuse angles  
(D) Two right angles

**Ans. : D. Two right angles**

25.  $179^\circ$  is an example of

- (A) a straight angle      (B) an obtuse angle      (C) an acute angle      (D) a right angle

**Ans. : B. an obtuse angle**

26. The instrument to measure an angle is a

- (A) ruler                      (B) protractor                      (C) divider                      (D) compasses

**Ans. : B. protractor**

\* a statement of Assertion (A) is followed by a statement of Reason (R). Choose [3] the correct option.

27. Assertion (A) Sharper the tip, thinner will be the dot. Reason (R) A point determines a location.

- (A) Both A and R are true and R is the correct explanation of A.  
(B) Both A and R are true but R is not the correct explanation of A.  
(C) A is true but R is false.  
(D) A is false but R is true.

**Ans. : A. Both A and R are true and R is the correct explanation of A.**

28. Assertion (A) A line contains a countless number of points.

Reason (R) Line extends indefinitely in both directions.

- (A) Both A and R are true and R is the correct explanation of A.  
(B) Both A and R are true but R is not the correct explanation of A.  
(C) A is true but R is false.  
(D) A is false but R is true.

**Ans. : A. Both A and R are true and R is the correct explanation of A.**

29. Assertion (A) A ray PQ can be written as PQ.

Reason (R) A ray has one end point and extends without limit in one direction only.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

Ans. : A. Both A and R are true and R is the correct explanation of A.

\* State Whether The Following Sentences Are True Or False.

[5]

30. An angle is made up of two rays starting from a common initial point.

Ans. : True

31. Two adjacent angles have exactly one common arm.

Ans. : True

32. The opposite edges of a ruler do not make a model of perpendiculars.

Ans. : True

33. The angle measure between the hands of the clock at the time 8 O'clock is  $90^\circ$ .

Ans. : False

34. If the arms of an angle on the paper are increased, then the angle increased.

Ans. : False

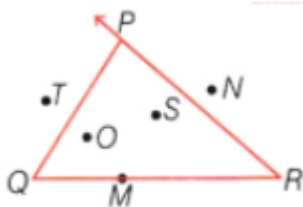
\* Fill In The Blanks With Correct Alternative.

[14]

35. The line segment joining two points A and B is denoted by \_\_\_\_\_.

Ans. :  $\overline{AB}$

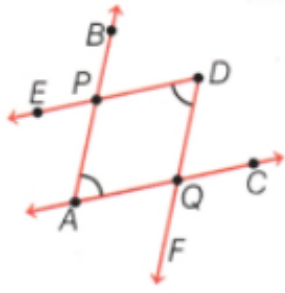
36. In the given figure, points lying in the interior of the figure are \_\_\_\_\_



Ans. : O and S

37. The number of common points in the two angles marked in the given figure is \_\_\_\_\_

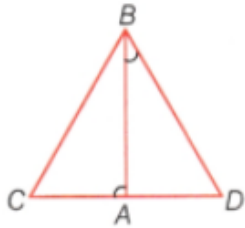




Ans. : Two

38. The common part between the two angles ZBAC and ZDAB in figure is

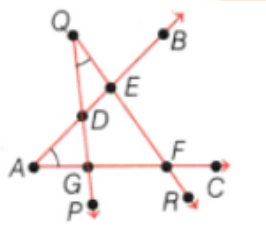
\_\_\_\_\_



Ans. : AB

39. The number of common points in the two angles marked in the given figure is

\_\_\_\_\_



Ans. : Four

40. An angle smaller than a right angle is an \_\_\_\_\_ angle.

Ans. : Acute

41. An angle larger than a right angle but less than a \_\_\_\_\_ straight angle is an angle.

Ans. : Obtuse

42. An angle larger than straight angle is \_\_\_\_\_ angle.

Ans. : Reflex

43. Sum of two acute angles never be \_\_\_\_\_ angle.

Ans. : Reflex or straight angle

44. Right angle is \_\_\_\_\_ of a revolution.

Ans. : one-fourth

45. Acute angle is less than \_\_\_\_\_ of a revolution.

Ans. : one-fourth

46. Straight angle is \_\_\_\_\_ of a revolution.

Ans. : half

47. Obtuse angle is between \_\_\_\_\_ and \_\_\_\_\_ of a revolution.

Ans. :  $\frac{1}{4}$  and half

48. Reflex angle is more than \_\_\_\_\_ of a revolution.

Ans. : half

\* Answer The Following Questions In One Sentence.[1 Marks Each]

[24]

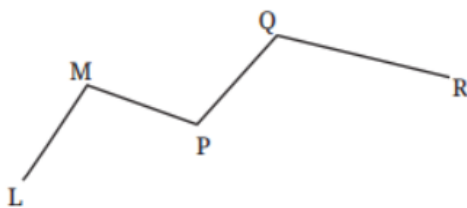
49. Rihan marked a point on a piece of paper.

How many lines can he draw that pass through the point. Sheetal marked two points on a piece of paper. How many different lines can she draw that pass through both of the points?

Can you help Rihan and Sheetal, find their answers?

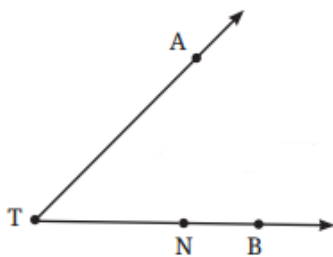
Ans. : Yes, Rihan can draw infinite lines passing through a point and Sheetal can draw only one line passing through both of the points.

50. Name the line segments in given figure. Which of the five marked points are on exactly one of the line segments? Which are on two of the line segments?



Ans. : The line segments in the given figure are  $\overline{LM}$ ,  $\overline{MP}$ ,  $\overline{PQ}$  and  $\overline{QR}$ . Points  $L$  and  $R$  are on exactly one of the line segments and points  $M$ ,  $P$  and  $Q$  are on two of the line segments.

51. Name the rays shown in given figure. Is  $T$  the starting point of each of these rays?



Ans. : Rays in the given figure are  $\overrightarrow{TA}$ ,  $\overrightarrow{TN}$  and  $\overrightarrow{TB}$ .

Yes,  $T$  is the starting point of each of these rays in given figure.

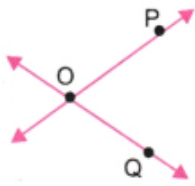
52. Draw a rough figure and write labels appropriately to illustrate each of the following:

(a)  $\overleftrightarrow{OP}$  and  $\overleftrightarrow{OQ}$  meet at  $O$ .

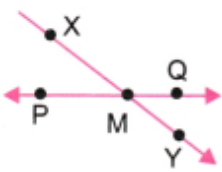


- (b)  $\overleftrightarrow{XY}$  and  $\overleftrightarrow{PQ}$  intersect at point  $M$ .
- (c) Line  $L$  contains points  $E$  and  $F$  but not point  $D$ .
- (d) Point  $P$  lies on  $AB$ .

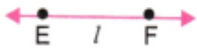
Ans. : (a)



(b)



(c)

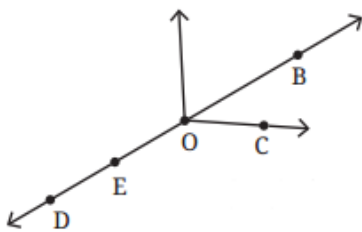


(d)



53. In the figure, name

- (a) five points
- (b) a line
- (c) four rays
- (d) five line segments



Ans. : (a) Five points are  $D, E, O, C$  and  $B$ .

(b) In the given figure, a line is  $\overleftrightarrow{DB}$ .

(c) Four rays are  $\overrightarrow{OC}, \overrightarrow{OB}, \overrightarrow{EB}$  and  $\overrightarrow{OD}$ .

(d) Five line segments are  $\overline{DE}, \overline{EO}, \overline{OB}, \overline{DO}$  and  $\overline{EB}$ .

54. Here is a ray  $\overrightarrow{OA}$  in given figure. It starts at  $O$  and passes through the point  $A$ . It also passes through the point  $B$ .

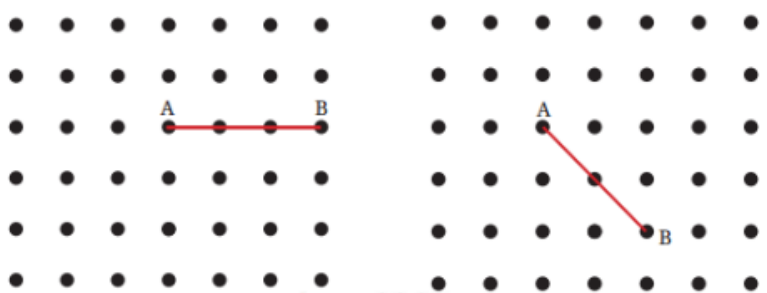
(a) Can you also name it as  $\overrightarrow{OB}$ ? Why?

(b) Can we write  $\overrightarrow{OA}$  as  $\overrightarrow{AO}$ ? Why or why not?

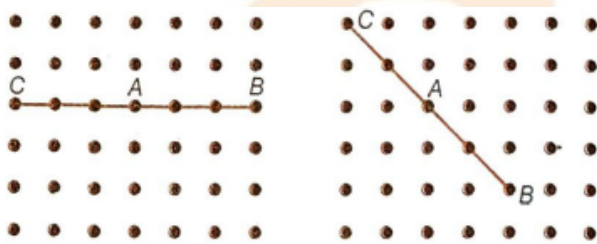
**Ans. :** (a) Yes, we can also name of ray  $\overrightarrow{OA}$  as ray  $\overrightarrow{OB}$  because initial point of both is same and going on endlessly in the same direction.

(b) No, we cannot not write  $\overrightarrow{OA}$  as  $\overrightarrow{AO}$  because initial point of a ray cannot be changed.

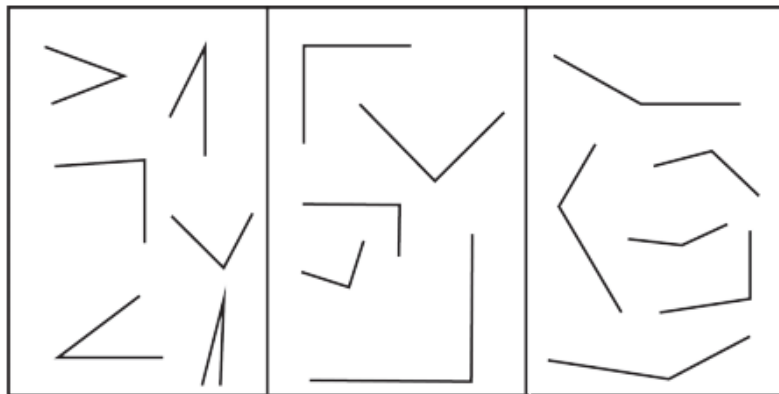
55. Join A to other grid points in the figure by a straight line to get a straight angle. What are all the different ways of doing it?



**Ans. :**



56. Identify acute, right, obtuse and straight angles in the given figures.



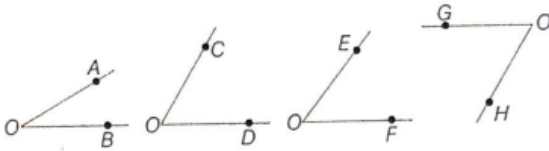
**Ans. :** In the first group, all the angles are less than a right angle. So, these are acute angles.

In the second group, all the angles are right angles. In the third group, all the angles are more than a right angle. So, these are obtuse angles.

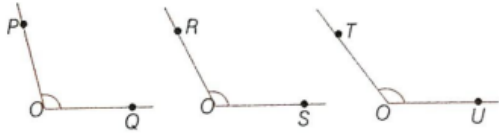
57. Make a few acute angles and a few obtuse angles. Draw them in different orientations.

Ans. :

Acute Angles



Obtuse Angles



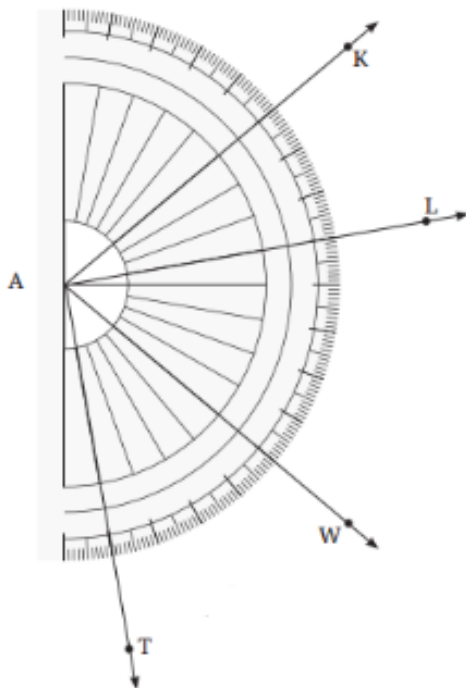
58. Do you know what the words acute and obtuse mean? Acute means sharp and obtuse means blunt. Why do you think these words have been chosen?

Ans. : The word 'acute and obtuse' are used to describe angles because they reflect the visual characteristics of the angle.

- **Acute angles** are called sharp because they are less than  $90^\circ$  and appear pointed, similar to the sharp edge of a knife.
- **Obtuse angles** are called 'blunt' because they are greater than  $90^\circ$  and appear wider, similar to the blunt end of an object.

**Explanation** These words help to visualise the nature of the angles where an acute angle looks more pointed and an obtuse angle looks wider and less pointed.

59. Write the measures of the following angles:



- (a)  $\angle KAL$     (b)  $\angle WAL$     (c)  $\angle TAK$

Ans. : (a) The number of units of 1 degree angle between  $KA$  and  $AL$  is 30.

$\therefore \angle KAL = 30^\circ$

(b) The number of units of 1 degree angle between  $LA$  and  $AW$  is 50.

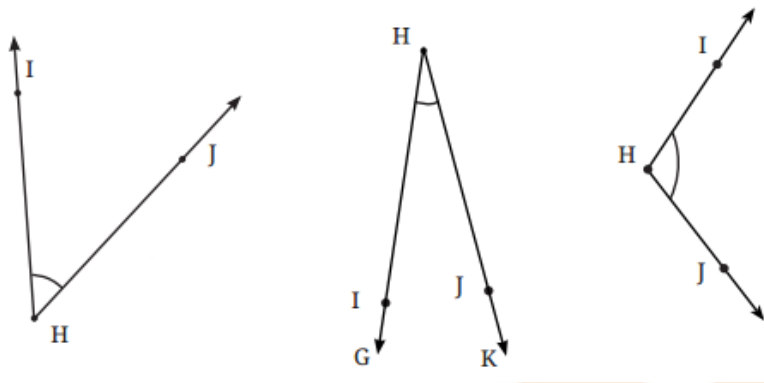
$\therefore \angle WAL = 50^\circ$



(c) The number of units of 1 degree angle between  $KA$  and  $AT$  is 120.

$$\therefore \angle TAK = 120^\circ$$

60. Find the degree measures of the following angles using your protractor.



**Ans. :** On measuring above angles by a protractor, we get

$$\angle IHJ = 48^\circ$$

$$\angle GHK = 25^\circ$$

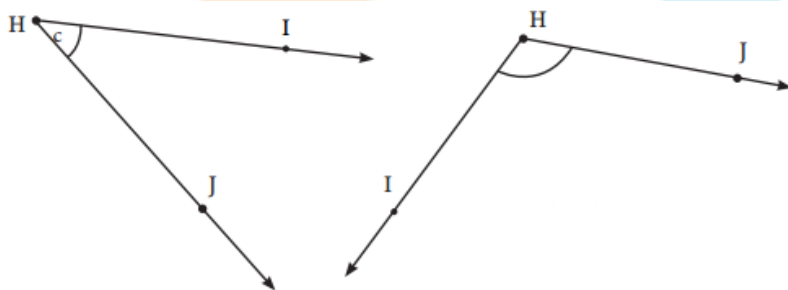
$$\text{and } \angle IHK = 110^\circ$$

61. Find the degree measures of different angles in your classroom using your protractor. .

**Ans. :** Angle at corner of blackboard =  $90^\circ$

Angle at corner of desk =  $90^\circ$

62. Find the degree measures for the angles given below. Check if your paper protractor can be used here!



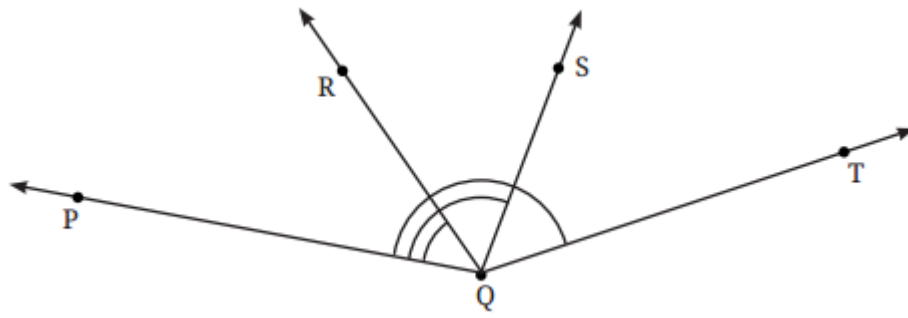
**Ans. :** In first figure, we get  $\angle IHJ = 45^\circ$

In second figure, we get  $\angle IHJ = 115^\circ$

**Explanation** To accurately measure these angles, insure your paper protractor is precise and that it can measure the angles in given figure.

63. Find the degree measures of  $\angle PQR$ ,  $\angle PQS$  and  $\angle PQT$ .

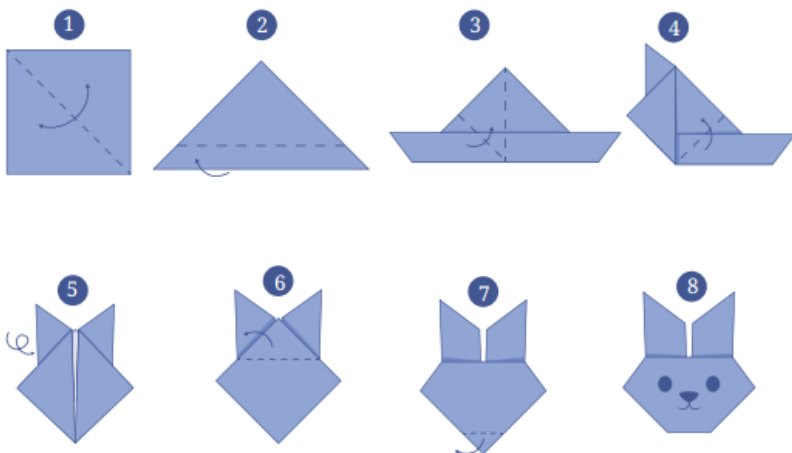




**Ans. :** In the given figure, on measuring each angle by placing the protractor at the vertex Q and reading the angles formed by the rays, we get

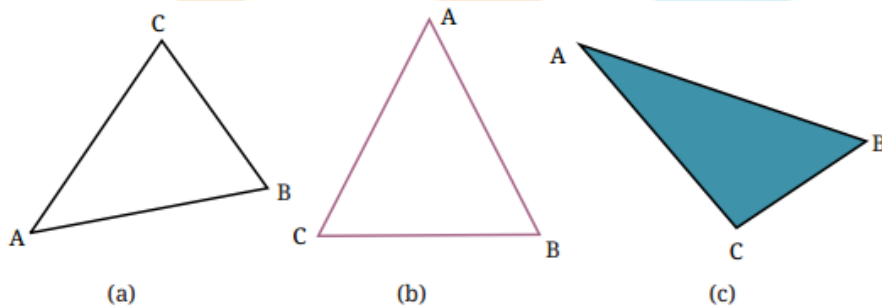
$$\angle PQR = 45^\circ, \angle PQS = 80^\circ \text{ and } \angle PQT = 150^\circ$$

64. Make the paper craft as per the given instructions. Then, unfold and open the paper fully. Draw lines on the creases made and measure the angles formed.



**Ans. :** self

65. Measure all three angles of the triangle shown in figure (a), and write the measures down near the respective angles. Now add up the three measures. What do you get? Do the same for the triangles in figure (b) and figure (c). Try it for other triangles as well, and then make a conjecture for what happens in general! We will come back to why this happens in a later year.



**Ans. :** (a) For triangle (a), on measuring angles  $\angle A$ ,  $\angle B$  and  $\angle C$  using protractor, we get

$$\angle A = 45^\circ, \angle B = 65^\circ \text{ and } \angle C = 70^\circ$$

On adding all the three angles, we get

$$45^\circ + 65^\circ + 70^\circ = 180^\circ$$

(b) For triangle (b), on measuring angles  $\angle A$ ,  $\angle B$  and  $\angle C$  using protractor, we get  $\angle A = 60^\circ$ ,  $\angle B = 60^\circ$  and  $\angle C = 60^\circ$

On adding all the angles, we get

$$60^\circ + 60^\circ + 60^\circ = 180^\circ$$

(c) For triangle (c), using protractor, we get  $\angle A = 35^\circ$ ,  $\angle B = 55^\circ$  and  $\angle C = 90^\circ$

On adding all the angles, we get

$$35^\circ + 55^\circ + 90^\circ = 180^\circ$$

Now, we can say that the sum of all the angles of a triangle is  $180^\circ$ .

66. Vidya is enjoying her time on the swing. She notices that the greater the angle with which she starts the swinging, the greater is the speed she achieves on her swing. But where is the angle? Are you able to see any angle?



Ans. : Yes, an angle can be seen.



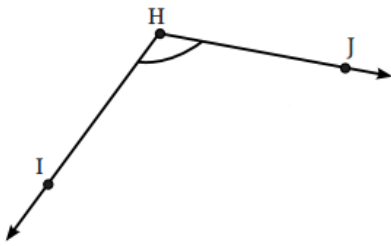
67. Observe the images below where there is an insect and its rotated version, fan angles be used to describe the amount of rotation? How? What will be the arms of the angle and the vertex?

Hint: Observe the horizontal line touching the insects.



**Ans. :** Both insects are rotated  $90^\circ$  clockwise.

68. Draw an angle whose degree measure is the same as the angle given below:



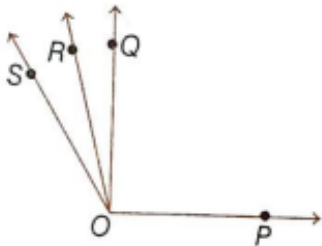
Also, write down the steps you followed to draw the angle.

**Ans. :** Step 1. Measure the given angle ( $\angle IHJ = 120^\circ$ )

Step 2. Using a protractor draw  $\angle ABC = 120^\circ$

69. Make any figure with three acute angles, one right angle and two obtuse angles.

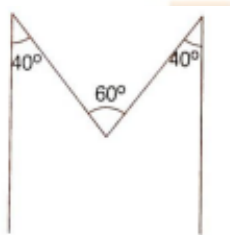
**Ans. :** The required figure is given below



In which  $\angle QOS, \angle QOR,$  and  $\angle ROS$  are three acute angles,  $\angle POQ,$  is one right angle and  $\angle PQR, \angle PQR$  are two obtuse angles.

70. Draw the letter 'M' such that the angles on the sides are  $40^\circ$  each and the angle in the middle is  $60^\circ$ .

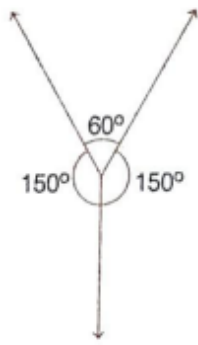
**Ans. :**



71. Draw the letter 'Y' such that the three angles formed are  $150^\circ, 60^\circ$  and  $150^\circ$ .



Ans. :



72. The Ashoka Chakra has 24 spokes. What is the degree measure of the angle between two spokes next to each other? What is the largest acute angle formed between two spokes?



Ans. :

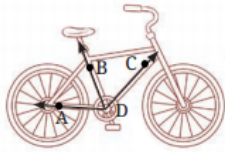


The angle between two spokes is  $15^\circ$  (i.e.  $360^\circ \div 24$ ) because the Ashoka Chakra is a circle and dividing  $360^\circ$  by the number of spokes 24 gives the angle between each pair of adjacent spokes. The largest acute angle formed between two spokes would be between adjacent spokes, which is  $15^\circ$

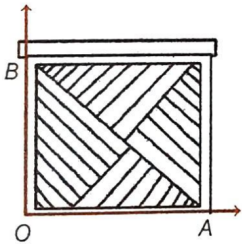
\* Questions With Calculation.[2 Marks Each]

[42]

73. Can you find the angles in the given pictures? Draw the rays forming any one of the angles and name the vertex of the angle.

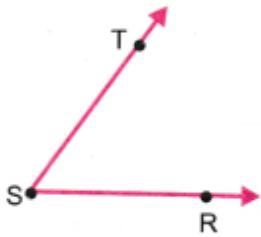


Ans. : Yes,

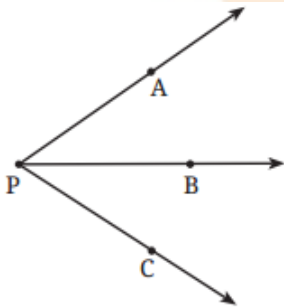


74. Draw and label an angle with arms  $ST$  and  $SR$ .

Ans. : An angle with arms  $ST$  and  $SR$  is  $\angle TSR$ .



75. Explain why  $\angle APC$  cannot be labelled as  $\angle P$ .



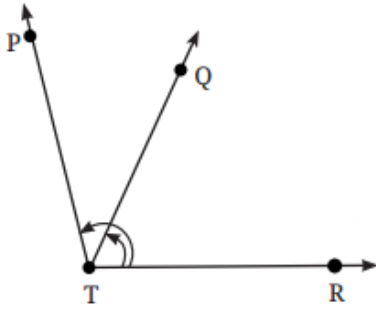
Ans. : In the given figure,  $\overrightarrow{PB}$  divides  $\angle APC$  in two parts and makes two angles  $\angle APB$  and  $\angle CPB$ .

So,  $\angle APC$  is greater than  $\angle APB$  and  $\angle CPB$ .

Therefore,  $\angle APC$  cannot be labelled as  $\angle P$ .



76. Name the angles marked in the given figure.



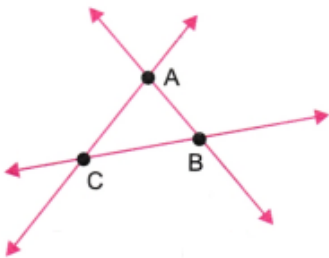
**Ans. :** Angles in the figure are :

Angle 1 is  $\angle RTP$

Angle 2 is  $\angle RTQ$

77. Mark any three points on your paper that are not on one line. Label them A, B and C. Draw all possible lines going through pairs of these points. How many lines do you get? Name them. How many angles can you name using A, B and C? Write them down and mark each of them with a curve as in given figure.

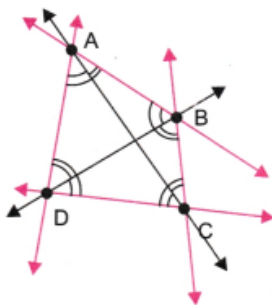
**Ans. :**



Lines are  $AB$ ,  $BC$  and  $AC$  and formed angles are  $\angle BAC$ ,  $\angle BCA$  and  $\angle CBA$ .

78. Now mark any four points on your paper so that no three of them are on one line. Label them A, B, C and D. Draw all possible lines going through pairs of these points. How many lines do you get? Name them. How many angles can you name using A, B, C and D? Write them all down and mark each of them with a curve as in given figure.

**Ans. :** Point  $A$ ,  $B$ ,  $C$  and  $D$  are as follow



Possible lines are  $AB$ ,  $BC$ ,  $CD$ ,  $AD$ ,  $AC$  and  $BD$ .

Thus, there are six lines formed and angles are

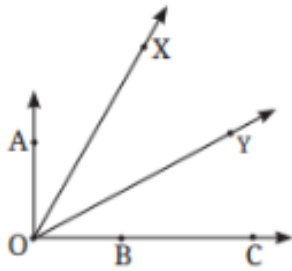
$\angle BAC$ ,  $\angle BAD$ ,  $\angle ADB$ ,  $\angle ADC$ ,  $\angle DCA$ ,  $\angle DCB$ ,  $\angle ABD$ ,  $\angle ABC$ ,  $\angle CAD$ ,  $\angle BDC$ ,  $\angle ACB$  and



$\angle DBC$ .

Thus, there are total twelve angles formed.

79. In each case, determine which angle- is greater and why.



(a)  $\angle AOB$  or  $\angle XOY$

(b)  $\angle AOB$  or  $\angle XOB$

(c)  $\angle XOB$  or  $\angle XOC$

Discuss with your friends on how you decided which one is greater.

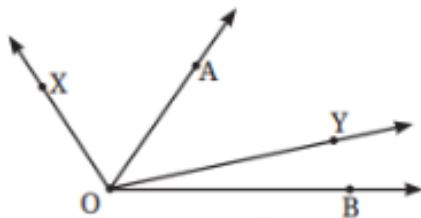
**Ans. :** On comparing the given angles in the figure by superimposition.

(a)  $\angle AOB$  is greater because size of  $\angle AOB$  is greater than size of  $\angle XOY$ .

(b)  $\angle AOB$  is greater because size of  $\angle AOB$  is greater than size of  $\angle XOB$ .

(c)  $\angle XOB$  and  $\angle XOC$  both are equal angle because vertex  $O$  and one ray  $\overrightarrow{OX}$  are common and arm  $\overrightarrow{OB}$  and  $\overrightarrow{OC}$  are overlapping.

80. Which angle is greater:  $\angle XOY$  or  $\angle AOB$ ? Give reasons.



**Ans. :** On comparing by superimposition, the angles  $\angle XOY$  and  $\angle AOB$  in the given figure, we get

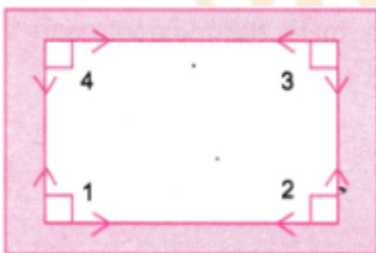
$\angle XOY$  is greater than  $\angle AOB$  because size of  $\angle XOY$  is greater.

81. How many right angles do the windows of your classroom contain? Do you see other right angles in your classroom?

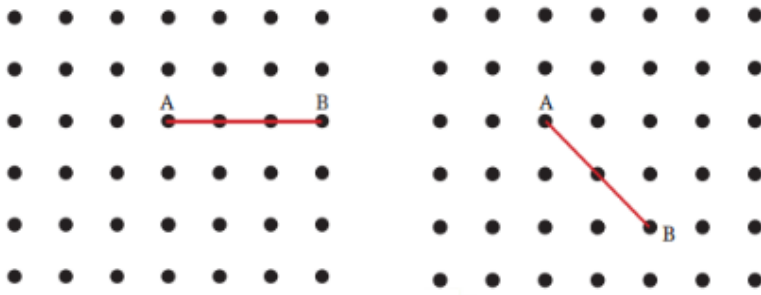
**Ans. :** A window has 4 right angles.

$\angle 1, \angle 2, \angle 3$  and  $\angle 4$ .

Yes. At comers of door. At comers of blackboard etc.

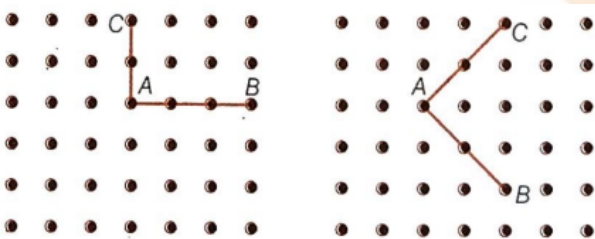


82. Now, join A to other grid points in the figure by a straight line to get a right angle. What are all the different ways of doing it?



**Hint:** Extend the line further as shown in the figure below. To get a right angle at A, we need to draw a line through it that divides the straight angle CAB into two equal parts.

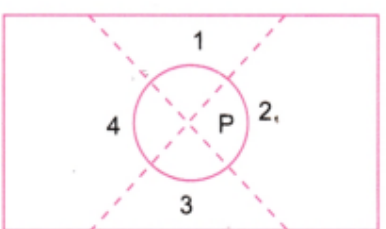
Ans. :



83. Get a slanting crease on the paper. Now, try to get another crease that is perpendicular to the slanting crease.

(a) How many right angles do you have now? Justify why the angles are exact right angles?

Ans. :



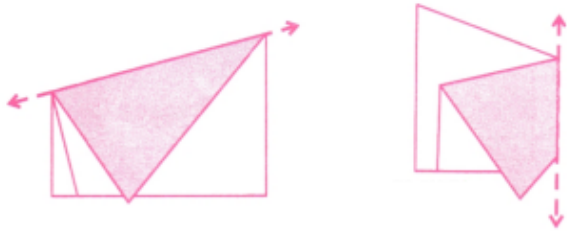
You will have four right angles now.

**Explanation** When you fold the paper to create a crease that is perpendicular to the first, the two creases intersect at a right angle dividing the plane into four right angles of  $90^\circ$  each.

84. Get a slanting crease on the paper. Now, try to get another crease that is perpendicular to the slanting crease.

(b) Describe how you folded the paper so that any other person who doesn't know the process can simply follow your description to get the right angle.

Ans. :



### To create a right angle

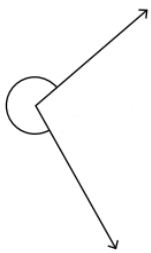
**I. First fold** Start by folding the paper so that one corner meets the opposite edge, creating a slant crease.

**II. Second fold** Now, fold the paper again but this time align the slanting crease with the edge of the paper, ensuring the fold is perpendicular to the first crease.

**III. Unfold** When you open the paper, you will see that the two creases intersect at a  $90^\circ$  angle, forming four right angles.

**Explanation** The second fold must be made carefully, aligning the first crease with the edge of the paper to insure the two creases are perpendicular. This guarantees that the angles formed are exactly  $90^\circ$ .

85. How can you find the degree measure of the angle given below using a protractor?



Ans. : To measure the given angle

**I. Place the protractor** Position the centre point of the protractor at the vertex of the angle.

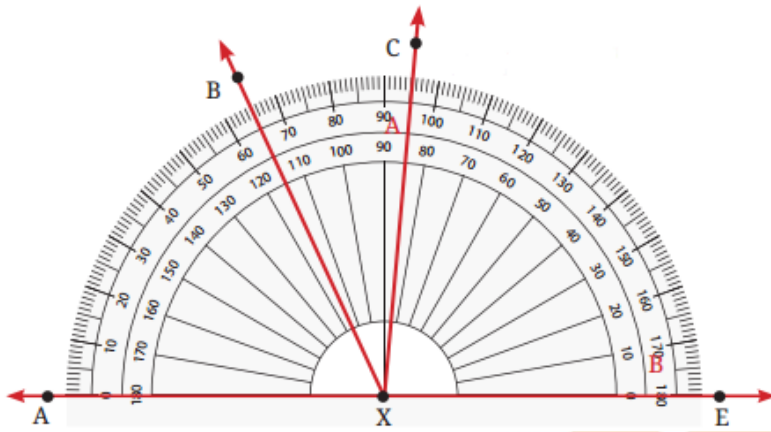
**II. Align the baseline** Align one of the angles ray with the  $0^\circ$  mark on the protractor's base line.

**III. Measure the angle** Look at where the other ray crosses the protractor's scale and read the degree measure.

Student Bro



86. Find the degree measures of  $\angle BXE$ ,  $\angle CXE$ ,  $\angle AXB$  and  $\angle EXC$ .



**Ans. :** In the given figure, on measuring each angle by placing the protractor at the vertex X and reading the angles formed by the rays, we get

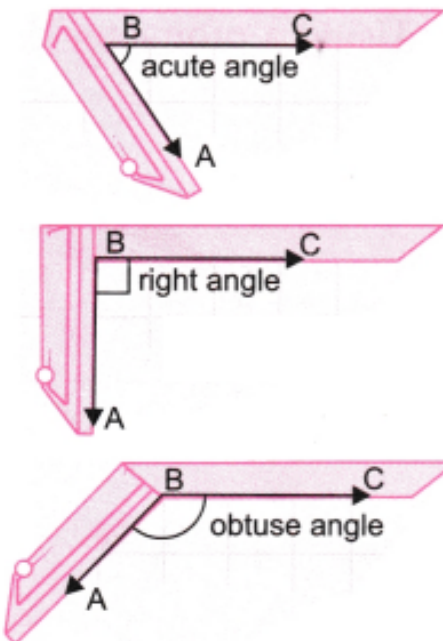
$$\angle BXE = 115^\circ, \angle CXE = 85^\circ$$

$$\angle AXB = 65^\circ \text{ and } \angle BXC = 30^\circ$$

87. The angle of a door: Is it possible to express the amount by which a door is opened using an angle? What will be the vertex of the angle and what will be the arms of the angle?



**Ans. :** Yes, it is possible.



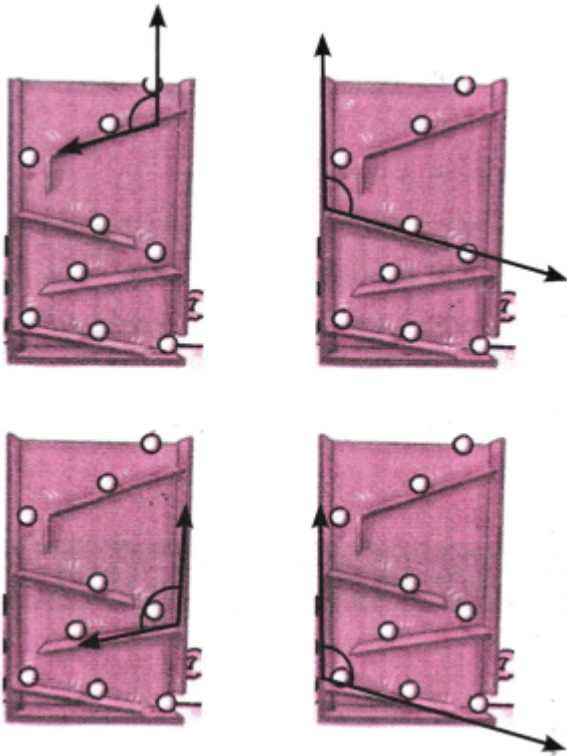
Here, vertex is B, and arms are AB and BC.

88. Here is a toy with slanting slabs attached to its sides; the greater the angles or slopes of the slabs, the faster the balls roll. Can angles be used to describe the

slopes of the slabs?



**Ans. :** Greater the angle, greater the slope.  
For each angle one arm is a side and one arm is the slope.

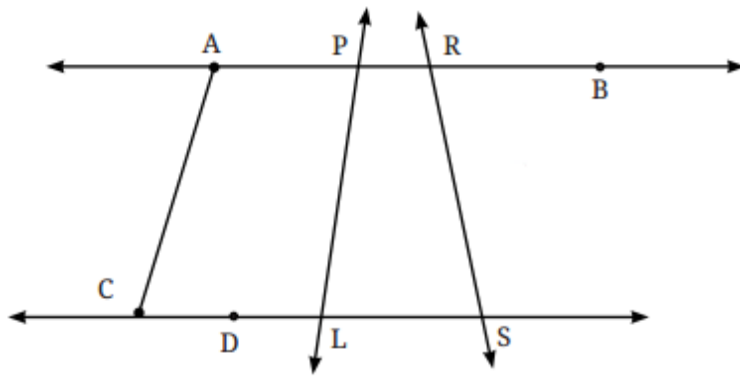


89. In Fig. below, list all the angles possible. Did you find them all? Now, guess the measures of all the angles. Then, measure the angles with a protractor. Record all

Student Bro

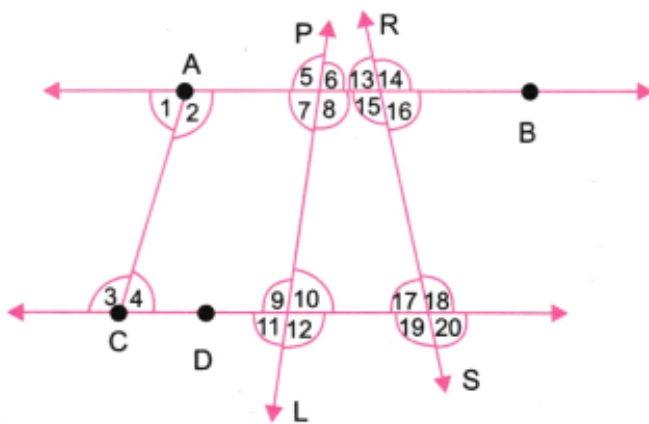


your numbers in a table. See how close your guesses are to the actual measures.



**Ans. :** The given figure has 20 angles.

Guess:  $\angle 1 = \angle 4 = 60^\circ; \angle 2 = \angle 3 = 120^\circ$  by actual measure:  
 $\angle 1 = \angle 4 = 70^\circ; \angle 2 = \angle 3 = 110^\circ$ .

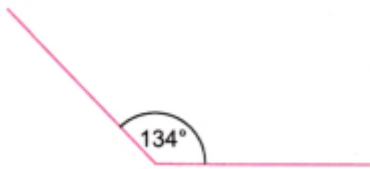
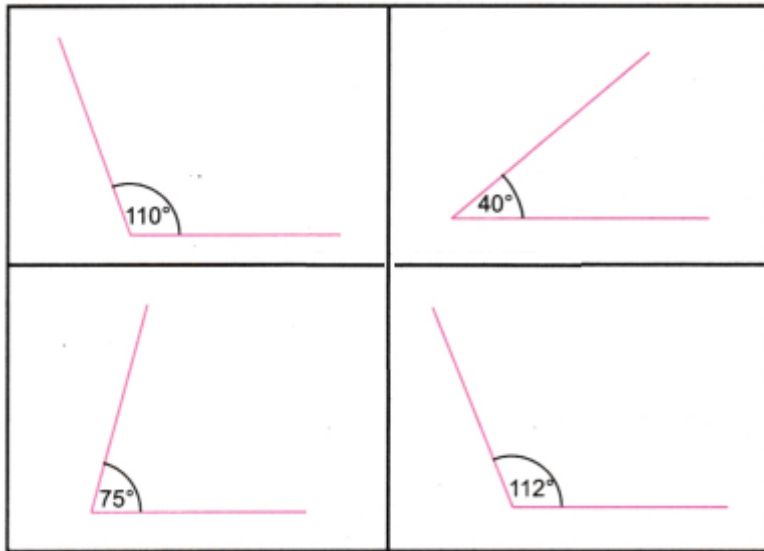


90. Use a protractor to draw angles having the following degree measures:

- (a)  $110^\circ$
- (b)  $40^\circ$
- (c)  $75^\circ$
- (d)  $1120$
- (e)  $134^\circ$

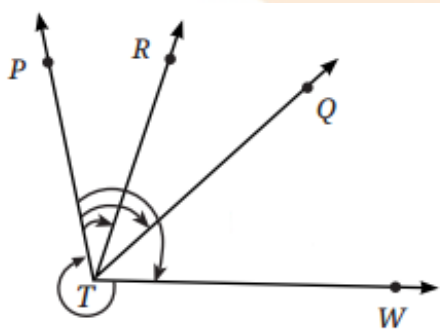
Student Bro

Ans. :



91. Use a protractor to find the measure of each angle. Then classify each angle as acute, obtuse, right, or reflex.

- a.  $\angle PTR$
- b.  $\angle PTQ$
- c.  $\angle PTW$
- d.  $\angle WTP$



- Ans. : (a)  $\angle PTR = 30^\circ$  acute  
(b)  $\angle PTQ = 60^\circ$  acute  
(c)  $\angle PTW = 105^\circ$  obtuse  
(d)  $\angle WTP = 225^\circ$  reflex

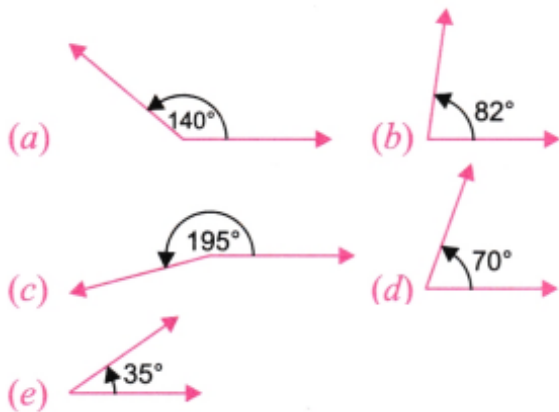
92. Draw angles with the following degree measures:

- (a)  $140^\circ$
- (b)  $82^\circ$
- (c)  $195^\circ$

(d)  $70^\circ$

(e)  $35^\circ$

Ans. :



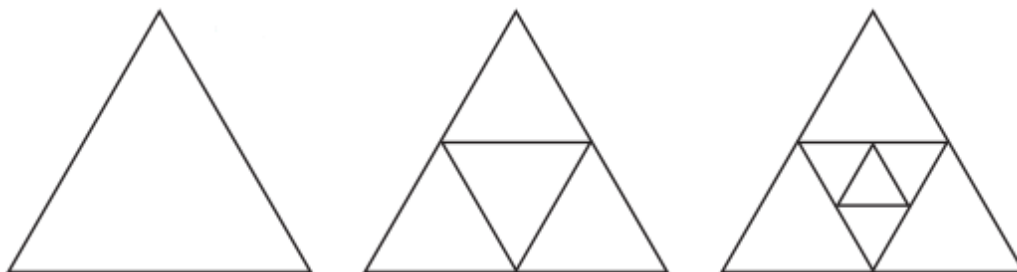
93. Puzzle: I am an acute angle. If you double my measure, you get an acute angle. If you triple my measure, you will get an acute angle again. If you quadruple (four times) my measure, you will get an acute angle yet again! But if you multiply my measure by 5, you will get an obtuse angle measure. What are the possibilities for my measure?

Ans. : The possibilities for measure are  $20^\circ$ ,  $21^\circ$  and  $22^\circ$

\* Questions With Calculation.[3 Marks Each]

[15]

94. Find out the number of acute angles in each of the figures below.



What will be the next figure and how many acute angles will it have? Do you notice any pattern in the numbers?

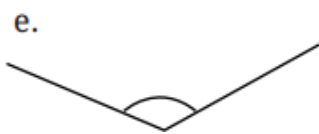
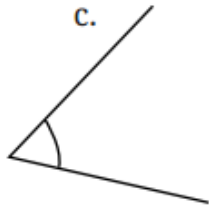
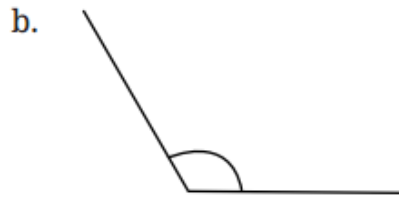
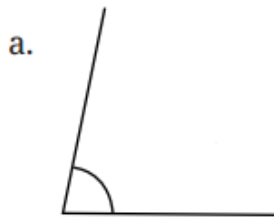
Ans. : **First figure** There are three acute angles in the first figure.

**Second figure** There are 12 acute angles in second figure (each of the 4 smaller triangles has 3 acute angles)

**Third figure** There are 21 acute angles in the third figure (each of the 7 smaller triangles has 3 acute angles).

**Explanation** As the figure increase in complexity, the number of acute angles increase in a pattern triangles and therefore more acute angles. The pattern shows that the number of acute angles triples with each step.

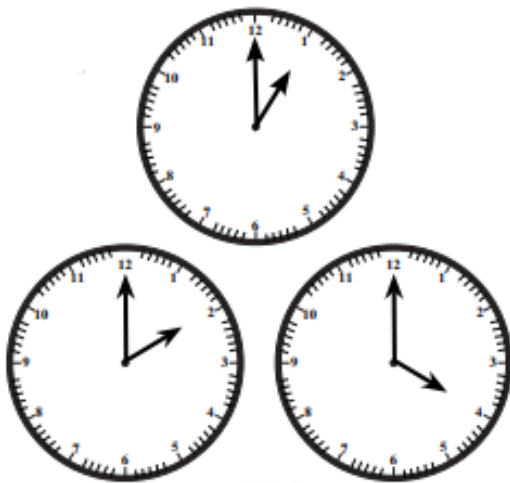
95. Measure and write the degree measures for each of the following angles:



- Ans. :** (a) Measure of given angle is  $80^\circ$   
(b) Measure of given angle is  $120^\circ$   
(c) Measure of given angle is  $60^\circ$   
(d) Measure of given angle is  $130^\circ$   
(e) Measure of given angle is  $130^\circ$   
(f) Measure of given angle is  $60^\circ$

96. Angles in a clock:

- (a) The hands of a clock make different angles at different times. At 1 o'clock, the angle between the hands is  $30^\circ$  Why?  
(b) What will be the angle at 2 o'clock? And at 4 o'clock? 6 o'clock?  
(c) Explore other angles made by the hands of a clock.



- Ans. :** (a) Numbers 1 to 12 are written along the circumference of a clock at equal distances.  $360 \div 12 = 30$ .



Hence, angle between two consecutive numbers is  $30^\circ$

At  $1^{\circ}$  clock hands are at 0 and 1 (consecutive numbers)

Hence angle between them is  $30^\circ$ .

(b) Angle between hands at  $2^{\circ}$  clock =  $2 \times 30^\circ = 60^\circ$  angle between hands at  $4^{\circ}$  clock =  $4 \times 30^\circ = 120^\circ$

Angle between hands at  $6^{\circ}$  clock =  $6 \times 30^\circ = 180^\circ$

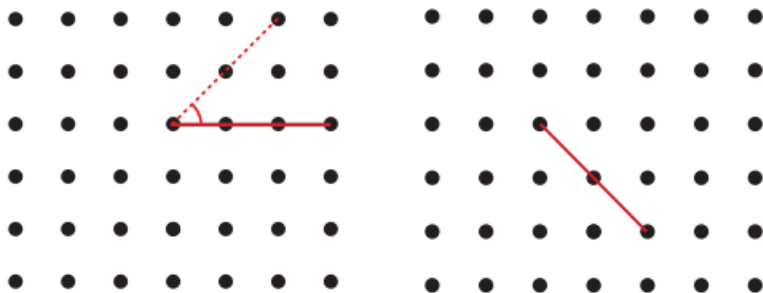
(c) Angle between hands at  $5^{\circ}$  clock =  $5 \times 30^\circ = 150^\circ$

Angle between hands at  $7^{\circ}$  clock =  $7 \times 30^\circ = 210^\circ$

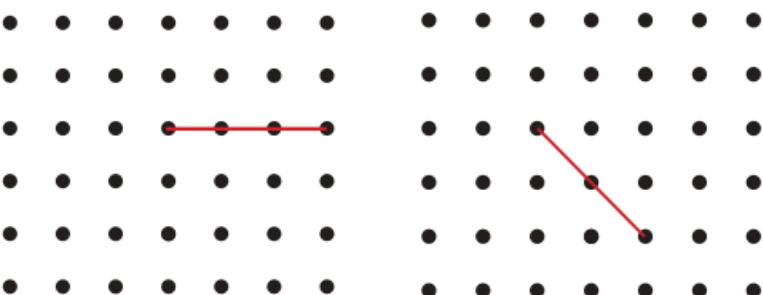
Angle between hands at  $8^{\circ}$  clock =  $8 \times 30^\circ = 240^\circ$

97. In each of the below grids, join A to other grid points in the figure by a straight line to get:

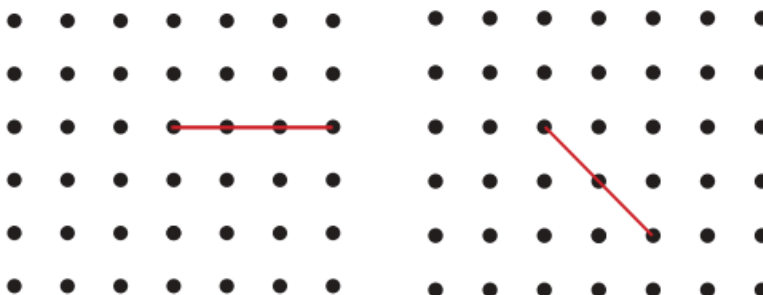
(a) An acute Angle



(b) An obtuse Angle



(c) A reflex Angle

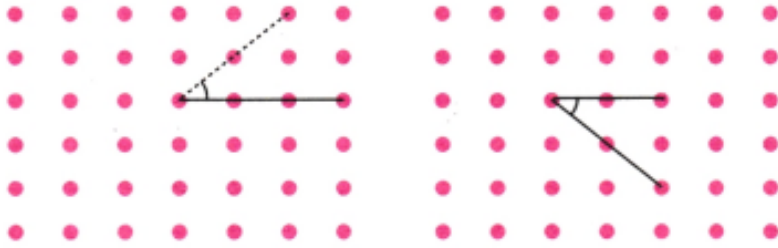


Mark the intended angles with curves to specify the angles. One has been done for you.

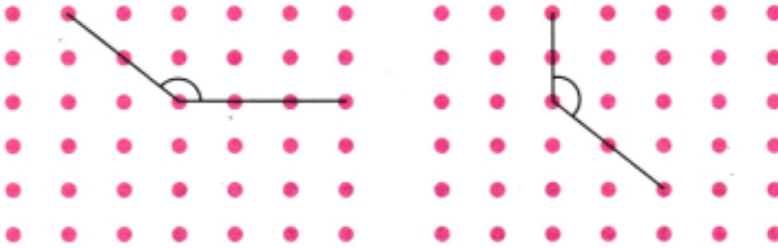


Ans. :

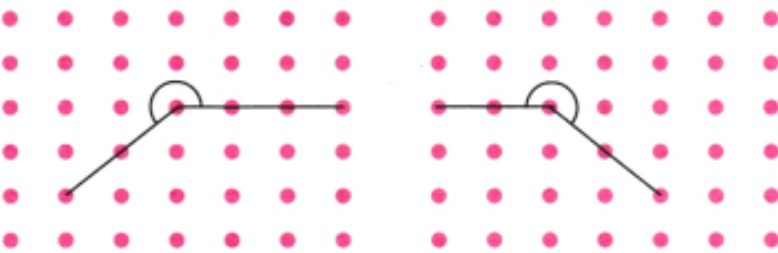
(a) An acute angle



(b) An obtuse angle



(c) A reflex angle



98. Estimate the size of each angle and then measure it with a protractor:

a.



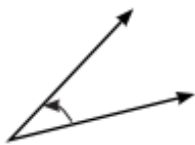
b.



c.



d.



e.



f.



Classify these angles as acute, right, obtuse or reflex angles.

Ans. : (a)  $45^\circ$  acute

(b)  $150^\circ$  obtuse

(c)  $120^\circ$  obtuse

(d)  $30^\circ$  acute

(e)  $95^\circ$  obtuse

(f)  $350^\circ$  reflex



\* Match the following.

[4]

99.	Column A	Column B
	(a) The line segment joining points A and B is denoted by	(i) vertex
	(b) Meeting point of a pair of sides is called	(ii) $\overline{AB}$
	(c) A ray $AB$ is denoted by	(iii) acute angle
	(d) Angle measure of less than $90^\circ$ is called	(iv) $\overrightarrow{AB}$

Ans. :

	Column A	Column B
	(a) The line segment joining points A and B is denoted by	(ii) $\overline{AB}$
	(b) Meeting point of a pair of sides is called	(i) vertex
	(c) A ray $AB$ is denoted by	(iv) $\overrightarrow{AB}$
	(d) Angle measure of less than $90^\circ$ is called	(iii) acute angle

-----

Student Bro