CLASS 6

LESSON 5

UNDERSTANDING ELEMENTARY SHAPES

Measuring Line Segments

The distance between the end points of a line segment is its length.

A graduated ruler and the divider are useful to compare lengths of line segments.

EXERCISE 5.1

1. What is the disadvantage in comparing line segments by mere observation?

Ans. Chances of errors due to improper viewing are more.

2. Why is it better to use a divider than a ruler, while measuring the length of a line segment?

Ans. Accurate measurement will be possible.

3. Draw any line segment, say AB. Take any point C lying between A and B. Measure the lengths of AB, BC and AC. Is AB = AC + CB?

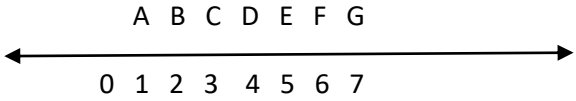
Ans. Yes. Because C is between A and B.

If A, B, C are any three points on a line such that AC + CB = AB, then we can be sure that C lies between A and B.

4. If A, B, C are three points on a line such that AB = 5 cm, BC = 3 cm and AC = 8 cm, which one of them lies between the other two?

Ans. B lies between A and C.

5. Verify, whether D is the midpoint of AG.



Ans. D is the midpoint of AG, because AD = DG = 3 units.

6. If B is the midpoint AC and C is the midpoint of BD, where A, B, C, D lie on a straight line, say why AB = CD?

Ans. AB = BC and BC = CD, therefore, AB = CD

7. Draw five triangles and measure their sides. Check in each case, if the sum of the lengths of any two sides is always less than the third side.

Ans. The sum of the lengths of any two sides of a triangle can never be less than the length of the third side.

ANGLES – Right and Straight

When a hand of a clock moves from one position to another position we have an example for an angle.

One full turn of the hand is one revolution.

A right angle is $\frac{1}{4}$ revolution and a straight angle is $\frac{1}{2}$ a revolution.

We use a protractor to measure the size of an angle in degrees.

The measure of a right angle is 90 degree and hence that of a straight angle is 180 degree.

A n angle is acute if its measure is smaller than that of a right angle and is obtuse if its measure is greater than that of a right angle and less than a straight angle.

A reflex angle is larger than a straight angle.

EXERCISE 5.2

1. What fraction of a clockwise revolution does the hour hand of a clock turn through, when it goes from

a) 3 to 9

b) 4 to 7

c) 7 to 10

d) 12 to 9

e) 1 to 10

f) 6 to 3

Ans.

a) $\frac{1}{2}$

b) $\frac{1}{4}$

c) $\frac{1}{4}$

d) $\frac{3}{4}$

e) $\frac{3}{4}$

f) $\frac{3}{4}$

2. Where will the hand of a clock stop if it

a) starts at 12 and makes $\frac{1}{2}$ of a revolution, clockwise?

b) starts at 2 and makes $\frac{1}{2}$ of a revolution, clockwise?

c) starts at 5 and makes $\frac{1}{4}$ of a revolution, clockwise?

d) starts at 5 and makes $\frac{3}{4}$ of a revolution, clockwise?

Ans.

a) 6

b) 8

c) 8

d) 2

3. Which direction will you face if you start facing

a) east and make $\frac{1}{2}$ of a revolution clockwise?

b) east and make $1\frac{1}{2}$ of a revolution clockwise?

c) west and make $\frac{3}{4}$ of a revolution anti-clockwise?

d) south and make one full revolution?

Ans.

a) west

b) west

c) north

d) south

4. What part of a revolution have you turned through if you stand facing

a) east and turn clockwise to face north?

b) south and turn clockwise to face east?

c) west and turn clockwise to face east?

Ans.

a) $\frac{3}{4}$

b) $\frac{3}{4}$

c) $\frac{1}{2}$

5. Find the number of right angles turned through by the hour hand of a clock when it goes from

a) 3 to 6

b) 2 to 8

c) 5 to 11

d) 10 to 1

e) 12 to 9

f) 12 to 6

Ans.

a) 1

b) 2

c) 2

d) 1

e) 3

f) 2

6. How many right angles do you make if you start facing

a) south and turn clockwise to west?

b) north and turn anti-clockwise to east?

c) west and turn to west?

d) south and turn to north?

Ans.

a) 1

b) 3

c) 4

d) 2

7. Where will the hour hand of a clock stop if it starts

a) from 6 and turns through 1 right angle?

b) from 8 and turns through 2 right angles?

c) from 10 and turns through 3 right angles?

d) from 7 and turns through 2 straight angles?

Ans. (we should consider only clockwise direction here)

a) 9

b) 2

c) 7

d) 7

EXERCISE 5.3

1. Match the following:

i) Straight angle	a) Less than one-fourth of a revolution
ii) Right angle	b) More than half a revolution
iii) Acute angle	c) Half of a revolution
iv) Obtuse angle	d) One-fourth of a revolution
v) Reflex angle	e) Between $\frac{1}{4}$ and $\frac{1}{2}$ of a revolution
	f) One complete revolution

Answer:

Straight angle – Half of a revolution

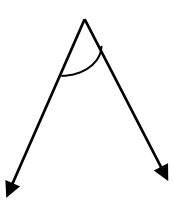
Right angle – One-fourth of a revolution

Acute angle – Less than one-fourth of a revolution

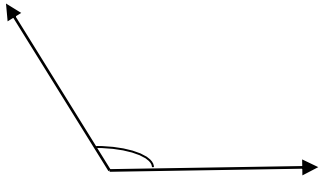
Obtuse angle – Between $\frac{1}{4}$ and $\frac{1}{2}$ of a revolution

Reflex angle- More than half a revolution

2. Classify each one of the following angles as right, straight, acute, obtuse or reflex:



(a)



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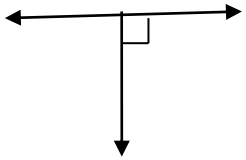

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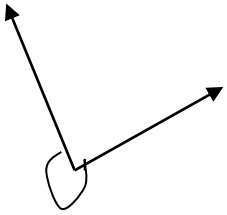

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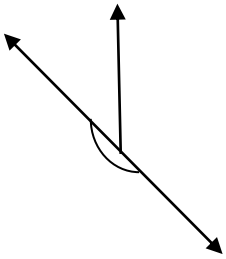
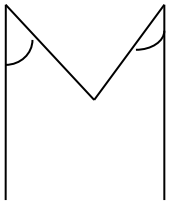


(e)



(f)

Answer:

a) Interior angle is acute.

b) Interior angle is obtuse.

c) Right angle

d) Exterior angle is reflex.

e) Exterior angle is straight.

f) Interior angles are acute.

EXERCISE 5.4

1. What is the measure of

i) a right angle?

ii) a straight angle?

Ans.i) 90 degree

ii) 180 degree

2. Say True or False:

a) The measure of an acute angle is less than 90 degree.

b) The measure of an obtuse angle is less than 90 degree.

c) The measure of a reflex angle is greater than 180 degree.

d) The measure of one complete revolution is equal to 360 degree.

e) If angle A = 53 degree and angle B = 35 degree, then angle A is greater than angle B.

Ans.

a) True

b) False

c) True

d) True

e) True

3. Write down the measures of

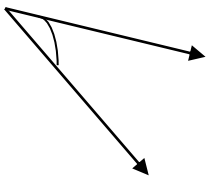
a) a) some acute angles.

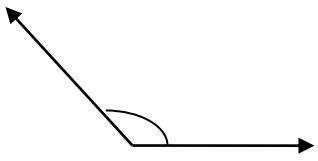
b) some obtuse angles.

Ans.a) 23 degree, 89 degree

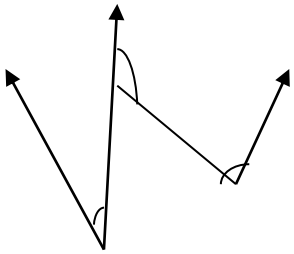
b) 91 degree, 179 degree

4. Measure the angles given below using the Protractor write down the measure.





(a) (b)



(c) (d)

Answer:

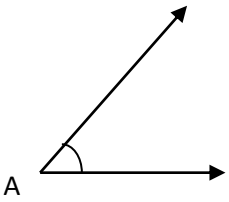
a) 40 degree

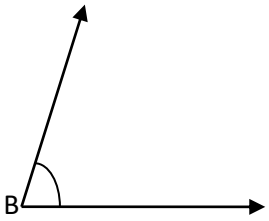
b) 130 degree

c) 90 degree

d) 60 degree

5. Which angle has a large measure? First estimate and then measure.



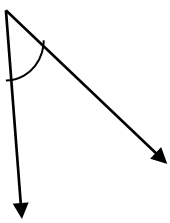


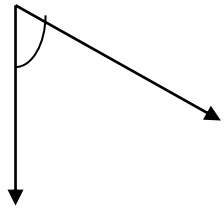
Ans. Angle B has larger measure.

Measure of angle A = 40 degree

Measure of angle B = 65 degree.

6. From these two angles which has larger measure? Estimate and then confirm by measuring them.





Ans.

The measures of these angles are 45 degree and 55 degree. Therefore, the angle shown in the seconds figure is greater.

7. Fill in the blanks with acute, obtuse, right or straight:

a) An angle whose measure is less than that of a right angle is ----------

b) An angle whose measure is greater than that of a right angle is ---------

c) An angle whose measure is the sum of the measures of two right angles is --------

d) When the sum of the measures of two angles is that of a right angle, then each one of them is ----------
e) When the sum of the measures of two angles is that of a straight angle and if one of them is acute then the other should be- ----------

Answer;

a) Acute

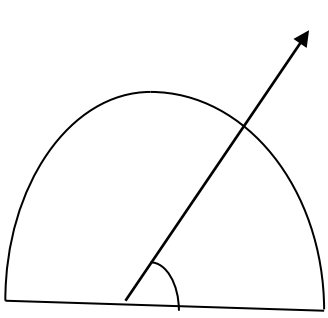
b) Obtuse (if the angle is less than 180)

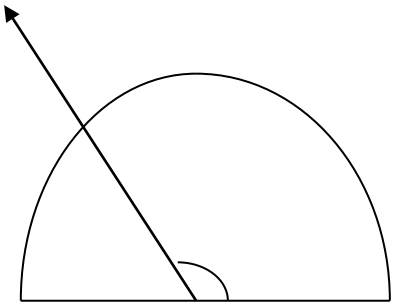
c) straight

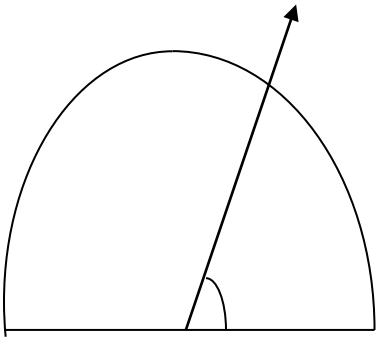
d) Acute

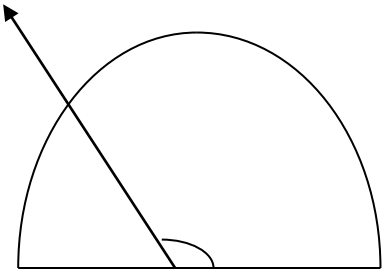
e) An obtuse angle

8. Find the measure of the angle shown in each figure.(First estimate with your eyes and then find the actual measure with a protractor)





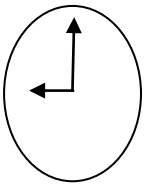




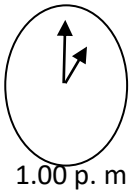
Answer:

The measures of the angles are 40, 130, 65, 135 degrees respectively.

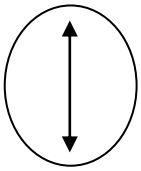
9. Find the angle measure between the hands of the clock in each figure;



9.00 a. m



1.00 p. m

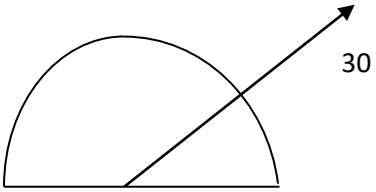


Answer: 6.00 p. m

The angle measurers are 90, 30 and 180 respectively.

10. Investigate

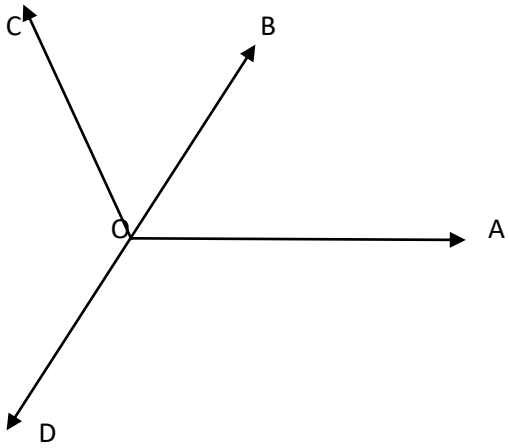
In the given figure, the angle measures 30 degree. Look at the same figure through a magnifying glass. Does the angle become larger? Does the size of the angle change?



Answer

The view through a magnifying glass will not change the angle measure.

11. Measure and classify each angle:



Answer:

Angle	Measure	Type
AOB	40	Acute
AOC	125	Obtuse
BOC	85	Acute
DOC	95	Obtuse
DOA	140	Obtuse
DOB	180	Straight