Prepared by -Pranjali Patil	L-5 Understanding elementary shapes

Ex 5.1

1)Solution:
Comparing the lengths of two line segments simply by 'observation' may not be accurate. So we use divider to compare the length of the given line segments.

2)Solution:
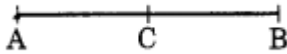Measuring the length of a line segment using a ruler, we may have the following errors:
(i) Thickness of the ruler
(ii) Angular viewing
These errors can be eradicated by using the divider. So, it is better to use a divider than a ruler, while measuring the length of a line segment.

3)Solution:
Let us consider

A, B and C such that C lies between A and B and AB = 7 cm.
AC = 3 cm, CB = 4 cm.
∴ AC + CB = 3 cm + 4 cm = 7 cm.
But, AB = 7 cm.
So, AB = AC + CB.

4)Solution:
We have, AB = 5 cm; BC = 3 cm
∴ AB + BC = 5 + 3 = 8 cm
But, AC = 8 cm
Hence, B lies between A and C.

5)Solution:
From the given figure, we have
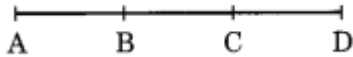AG = 7 cm – 1 cm = 6 cm
AD = 4 cm – 1 cm = 3 cm
and DG = 7 cm – 4 cm = 3 cm
∴ AG = AD + DG.
Hence, D is the mid point of $\overline{AG}$.

6)Solution:
We have

B is the mid point of $\overline{AC}$.
∴ AB = BC …(i)
C is the mid-point of $\overline{BD}$.
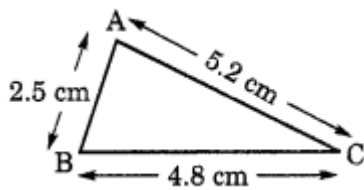BC = CD
From Eq.(i) and (ii), We have
AB = CD

7)Solution:
Case I. In ∆ABC

Let AB = 2.5 cm
BC = 4.8 cm
and AC = 5.2 cm
AB + BC = 2.5 cm + 4.8 cm
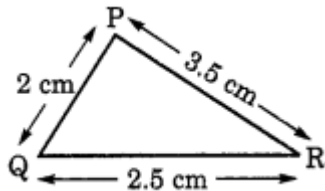= 7.3 cm
Since, 7.3 > 5.2
So, AB + BC > AC
Hence, sum of any two sides of a triangle is greater than the third side.

Case II. In ∆PQR,

Let PQ = 2 cm
QR = 2.5 cm
and PR = 3.5 cm
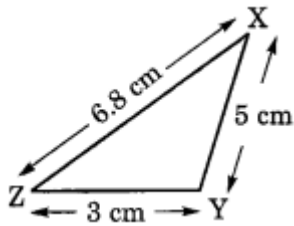PQ + QR = 2 cm + 2.5 cm = 4.5 cm
Since, 4.5 > 3.5
So, PQ + QR > PR
Hence, sum of any two sides of a triangle is greater than the third side.

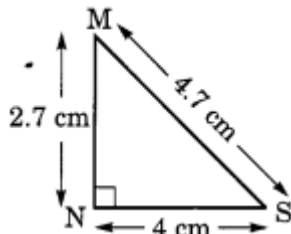Case III. In ∆XYZ,

Let XY = 5 cm
YZ = 3 cm
and ZX = 6.8 cm
XY + YZ = 5 cm + 3 cm
= 8 cm
Since, 8 > 6.8
So, XY + YZ > ZX
Hence, the sum of any two sides of a triangle is greater than the third side.

Case IV. In ∆MNS,

Let MN = 2.7 cm
NS = 4 cm
MS = 4.7 cm
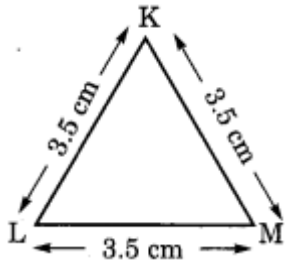and MN + NS = 2.7 cm + 4 cm = 6.7 cm
Since, 6.7 >4.7
So, MN + NS > MS
Hence, the sum of any two sides of a triangle is greater than the third side.

Case V. In ∆KLM,

Let KL = 3.5 cm
LM = 3.5 cm
KM = 3.5 cm
and KL + LM = 3.5 cm + 3.5 cm = 7 cm
7 cm > 3.5 cm
Solution:
(i) For one-fourth revolution, we have
So, KL + LM > KM
Hence, the sum of any two sides of a triangle is greater than the third side.

Hence, we conclude that the sum of any two sides of a triangle is never less than the third side.

Exercise -5.2

Q1-Solution:
(a) 3 to 9
$9 - 3 = 6 \div 12 = \frac{1}{2}$ of a revolution
(b) 4 to 7
$7 - 4 = 3 \div 12 = \frac{1}{4}$ of a revolution
(c) 7 to 10
$10 - 7 = 3 \div 12 = \frac{1}{4}$ of a revolution
(d) 12 to 9 i.e., 0 to 9
$9 - 0 = 9 \div 12 = \frac{3}{4}$ of a revolution
(e) 1 to 10
$10 - 1 = 9 \div 12 = \frac{3}{4}$ of a revolution
(f) 6 to 3 i.e., 6 to 12 and then 12 to 3
6 to 12 = 12 – 6 = 6 and 12 to 3 = 0 to 3 = 3 – 0 = 3
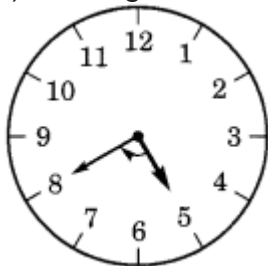$6 + 3 = 9 \div 12 = \frac{3}{4}$ of a revolution

Q2-Solution:
(a) Starting from 12 and making $\frac{1}{2}$ of a revolution, the clock hand stops at 6.

(b) Starting from 2 and making $\frac{1}{2}$ of a revolution, the clock hand stops at 8.
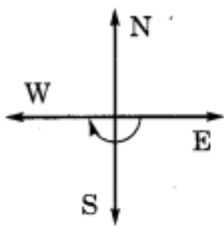

(c) Starting from 5 and making $\frac{1}{2}$ of a revolution, the clock hand stops at 8.
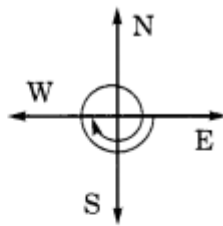
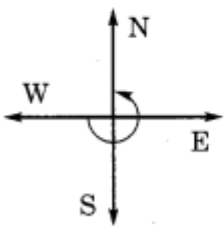(d) Starting from 5 and making $\frac{1}{2}$ of a revolution, the clock hand stops at 2.
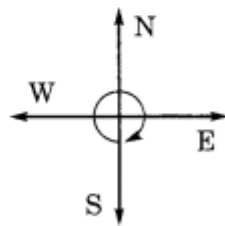

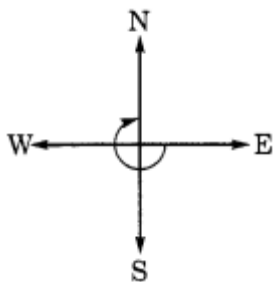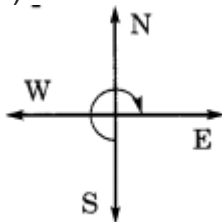Q3-Solution:

West
(a)

West
(b)

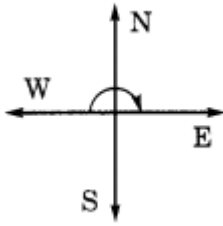North
(c)

South
(d)

Q4-Solution:
(a) If we start from east and reach at north (turning clockwise) $\frac{3}{4}$ of a revolution is required.

(b) If we start from south turning clockwise to face east, $\frac{3}{4}$ of a revolution is required.
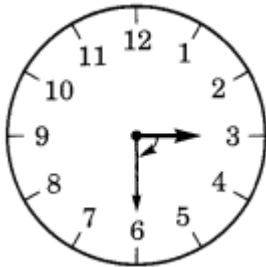
(c) If we start from west turning clockwise to face east, 12 of a revolution is required.

Q5-

(a) 3 to 6

Starting from 3 to 6, the hour hand turns through 1 right angle.

(b) 2 to 8

Starting from 2 to 8, the hour hand turns through 2 right angles.
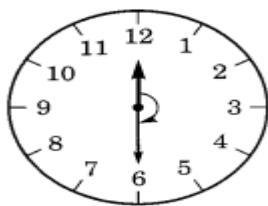
(c) 5 to 11

(d) 10 to 1

Starting from 10 to 1, the hour hand turns through 1 right angle.
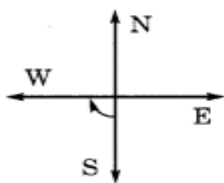
(e) 12 to 9

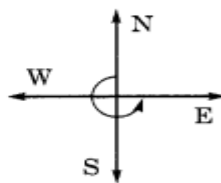Starting from 12 to 9, the hour hand turns through 3 right angles.
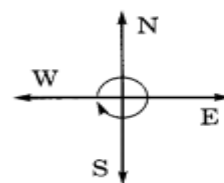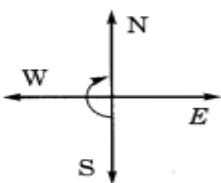
(f) 12 to 6

Q 6-Solution:

(a)
(1 Right angle)

(b)
(3 Right angles)

(c)
(4 Right angles)

(d)
(2 Right angles)

Q-7 Solution:
(a) Starting from 6 and turning through 1 right angle, the hour hand stops at 9.

(b) Starting from 8 and turning through 2 right angles, the hour hand stops at 2.
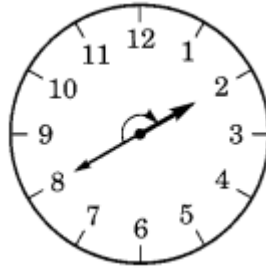
(c) Starting from 10 and turning through 3 right angles, the hour hand stops at 7.
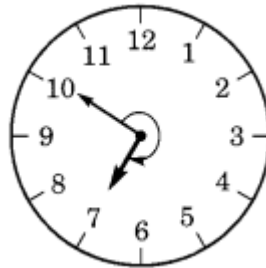
(b) Starting from 7 and turning through 2 right angles, the hour hand stops at 7.
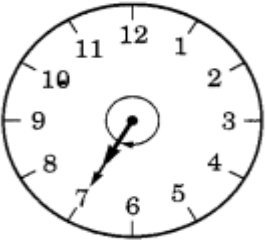
Exercise-5.3
Solution:
(i) Straight angle   ↔   (c) Half of a revolution.
(ii) Right angle   ↔   (d) One-fourth of a revolution.
(iii) Acute angle   ↔   (a) Less than one-fourth of a revolution.
(iv) Obtuse angle   ↔   (e) Between 14 and 12 of a revolution.
(v) Reflex angle   ↔   (f) One complete revolution, right, acute, obtuse or reflex.

 Q2-Solution:
(a) Acute angle

(b) Obtuse angle
(c) Right angle
(d) Reflex angle
(e) Straight angle
(f) Acute angle

 Exercise 5.4

1.Solution:
(i) Measure of a right angle = 90°
(ii) Measure of a straight angle = 180°

2. Solution:
(a) True
(b) False
(c) True
(d) True
(e) True

3. Solution:
(a) 25°, 63° and 72° are acute angles.
(b) 105°, 120° and 135° are obtuse angles.

4. Solution:
(a) 45°
(b) 125°
(c) 90°
(d) ∠1 = 60°, ∠2 = 90°, ∠3 = 125°

5. Solution:
Measure of Angle A = 40°
Measure of Angle B = 60°.

6. Solution:
The opening of angle (b) is more than angle (a).

(a)   (b)
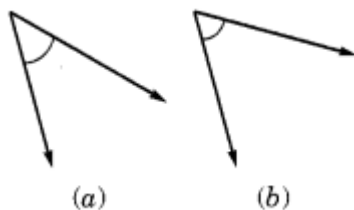
∴ Measure of angle (a) = 45°
and the measure of angle (b) = 60°

7. Solution:
(a) acute
(b) obtuse
(c) straight
(d) acute
(e) obtuse

8.Solution:
(a) Measure of the angle = 40°
(b) Measure of the angle = 130°
(c) Measure of the angle = 65°
(d) Measure of the angle = 135°.

9.Solution:
(i) The angle between hour hand and minute hand of a clock at 9.00 a.m = 90°
(ii) The angle between the hour hand and minute hand of a clock at 1.00 p.m = 30°
(iii) The angle between the hour hand and minute hand of a clock at 6.00 p.m = 180°.

Exercise 5.5

1.Solution:

Yes

No

Yes

No

2.Since PQ------- ⊥ XY
∴ ∠PAY = 90°
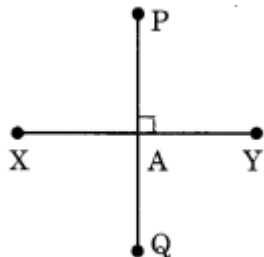
3. Solution:
The figures of the two set-squares are given below:

(a)   (b)
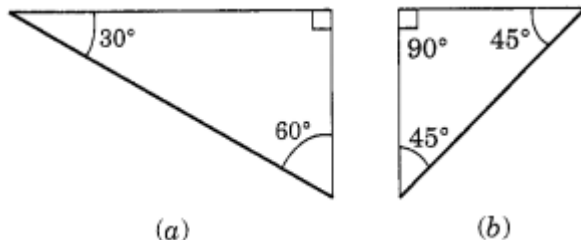
The measure angles of triangle (a) are : 30°, 60° and 90°.
The measure angles of triangle (b) are 45°, 45° and 90°.
Yes, they have a common angle of measure 90°.

4.(a) Yes,
Since, CE = 2 units and EG = 2 units
Hence, CE = EG.

(b) Yes, PE bisects CG
(c) Required line segments for which PE is perpendicular bisector
are: $\overline{BG}$ and $\overline{DF}$
(d) (i) True (ii) True (iii) True
Exercise 5.6

Solution:
1.(a) Lengths of the sides of a triangle are given as: 7 cm, 8 cm and 9 cm.
Since, all sides of the given triangle are different.
Hence, it is a Scalene triangle.
(b) Given that: AB = 8.7 cm, AC = 7 cm and BC = 6 cm
Here AB ≠ AC ≠ BC Hence, ΔABC is Scalene triangle.
(c) Given that: PQ = QR = PR = 5 cm
Since all sides are equal.
Hence, it is an equilateral triangle.
(d) Given that: In ΔDEF, m∠D = 90°
Hence it is a right angled triangle.
(e) Given that: In ΔXYZ, m∠Y = 90° and XY = YZ
Hence it is a right angled triangle.
(f) Given that: ΔLMN, m∠L = 30°, m ∠M = 70° and m∠N = 80°.
2.Solution:
(i) ↔ (e)
(ii) ↔ (g)
(iii) ↔ (a)
(iv) ↔ (f)
(v) ↔ (d)
(vi) ↔ (c)
(vii) ↔ (b)ence it is an acute angled triangle.

3.Solution:
(a) (i) Acute angled triangle
(ii) Isosceles triangle

(b) (i) Right angled triangle
(ii) Scalene triangle

(c) (i) Obtuse angled triangle
(ii) Isosceles triangle

d) (i) Right angled triangle
(ii) Isosceles triangle

(e) (i) Acute angled triangle
(ii) Equilateral triangle

(f) (i) Obtuse angled triangle
(ii) Scalene triangle

1. Solution:
(a) True
(b) True
(c) True
(d) True
(e) False
(f) False

2.Solution:
(a) A square has all the properties as that of rectangle. So, it is a special rectangle.
(b) A rectangle has the same properties as that of parallelogram. So, it is a special parallelogram.

(c) A square has the same properties as that of a rhombus. So, it is a special rhombus.
(d) Square, rectangles and parallelogram are all quadrilateral as they are all enclosed by four sides.

3.Solution:
Square is only the regular quadrilateral with equal sides and equal angles.
Therefore, square is a regular quadrilateral.

Exercise5.8

1.Solution:
(a) The given figure is not closed. Therefore, it is not a polygon.
(b) The given figure is a polygon.
(c) The given figure is not a polygon because every polygon is enclosed with line segments.
(d) The given figure is not a polygon because it is enclosed by an arc and two line segments.

3. Solution:
ABCDEF is a rough sketch of a regular hexagon. If we join any three vertices like D, A and B, we get a scalene triangle DAB.
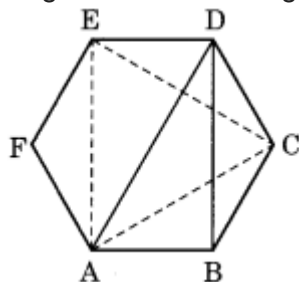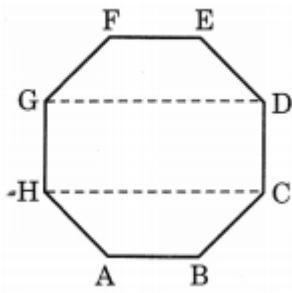

But if we join the alternate vertices, we get an equilateral triangle EAC.

4.Solution:
ABCDEFGH is a rough sketch of regular octagon. GHCD is the rectangle formed by joining

the four vertices of the given octagon.

5.Solution:

A B C D E is the rough sketch of a pentagon.

By joining its any two vertices, we get, the following diagonals.

AD-------- , AC-------- , BE-------- , BD-------- and CE--------