Part (1)

(1) Complete the following:

1) The area of the triangle whose base length 10cm and height 6cm equals ……… cm^2.
2) Two triangles which have the same base and their vertices opposite to this base on a straight line parallel to the base are …….. in area.
3) The area of the rhombus whose diagonals 12 cm, 8 cm equals ………….. cm^2.
4) The median of a triangle divide it into two triangle …..... in the area.
5) The area of trapezium whose parallel base 6 cm, 10 cm and height 5 cm. equals ………….
6) If two triangles have equal areas and drawn on the same base and in one side of it then …………
7) Surface of two parallelograms with common base and between two parallel lines ……………..
8) The median of a triangle divides its surface into ……..
9) Area of the parallelogram equals ………
10) Triangles of equal bases in length and lying between two parallel lines are equal in ……………
11) The area of the rhombus whose diagonals X cm, Y cm is …….
12) The area of the right angled triangle whose sides length of the right angle are 6 cm , 8 cm equals ……..
13) The area of the trapezium whose middle base 9 cm and height 6 cm equals ………

14) The measure of base angles of an isosceles trapezium are …..

15) The lengths of two adjacent sides in a parallelogram are 9 cm, 6 cm and the smallest height is 4cm then the length of the other height is …….

16) The height of trapezium whose parallel base are 5 cm, 7 cm and area of 42 cm^2 is …………….

17) The area of rhombus whose perimeter is 20 cm and height 4 cm = …………

18) The length of the diagonal of a square of area 50 cm^2 equals …. cm .

19) The length of side of a square whose area equals the area of a rectangle with dimensions 9 cm , 16 cm = …….

20) The length of the middle base of a trapezium whose area = 30 cm^2 and height 5 cm equals ………..

(2) Choose the correct answer:-

1) The length of the base of a triangle whose area 30 cm^2 and height 6 cm….

a) 5 b) 10 c) 15 d) 20

2) The length of the two adjacent sides in a parallelogram are 7 cm, 5 cm and the length of its smallest height is 4 cm then the area of the parallelogram equals ……… cm^2.

a) 35 b) 25 c) 28 d) 49

3) The area of trapezium whose middle base length is 10 cm and height 8 cm equals ……… cm^2.

a) 80 b) 60 c) 40 d) 20

4) The quadrilateral whose area equals half square of its diagonal is …………

a) parallelogram b) rectangle c) rhombus d) square

5) The diagonals of an isosceles trapezium ………..

a) congruent b) perpendicular

c) bisect each other d) parallel

6) The area of rhombus whose diagonals length are 6 cm, 8 cm equals …………...

a) 2 cm^2 b) 14 cm^2 d) 24 cm^2 d) 48 cm^2

7) The ratio between area of parallelogram and area of triangle if they have a common base and including between two parallel lines equals ……..

a) 1 : 2 b) 1 : 3 d) 2 : 1 d) 2 : 3

8) If the area of a square 18 cm^2 then length of its diagonal is ….….

a) 36 b) 12 c) 9 d) 6

9) If two triangles area equal in area and drawn on same base and in one side of it then their vertices lie on a straight line.

a) perpendicular to this base. b) bisect this base

c) parallel to this base d) intersects the base.

10) The quadrilateral whose area equals the square of its side length is…

a) parallelogram b) rectangle

c) rhombus d) square

11) The area of the rectangle whose dimensions 5 cm, 4 cm is ….

a) 9 cm^2 b) 10 cm^2 c) 20 cm^2 d) 40 cm^2

12) The side length of a square whose area equals the area of a parallelogram of base length 8 cm and corresponding height 4.5cm equals......

a) 6 cm   b) 13 cm   c) 18 cm   d) 36 cm

13) The median of a triangle divides its surface into two triangles ....

a) congruent   b) equals in area

c) isosceles   d) right angles

14) The perimeter of the square whose area 81 cm^2 = ... cm.

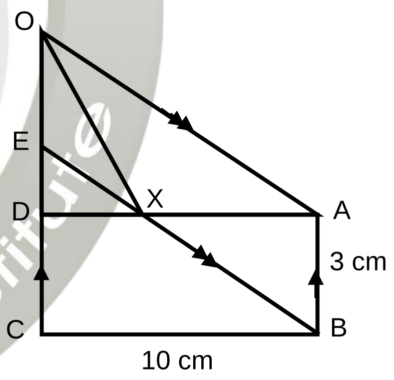
a) 24   b) 8   c) 9   d) 36

15) If the area of a rhombus is 24 cm^2 and the length of one of its diagonal is 6 cm then the length of the other diagonal is ....

a) 4 cm   b) 8 cm   c) 10 cm   d) 12 cm

(3) Essay Questions:-

(1) In opposite figure :

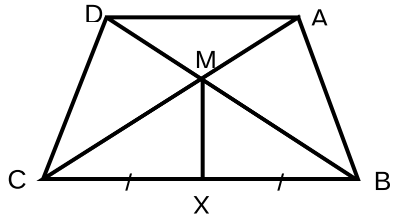


ABCD is a rectangle, ABEO is a parallelogram,

AB = 3 cm, BC = 10 cm

Find with proof: the area of Δ AXO

(2) In the opposite figure:



$\overline{AD} // \overline{BC}$, X midpoint of $\overline{BC}$ prove that:

(i) Area of Δ AMB = area of Δ DMC

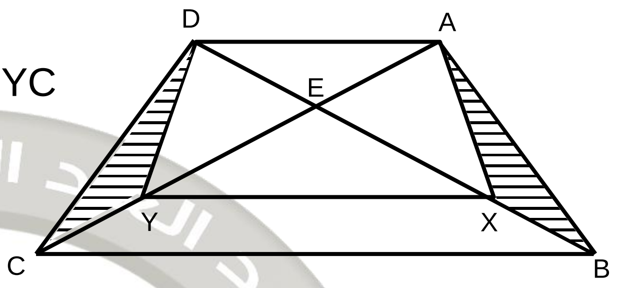
(ii) Area of shape ABXM = area of shape DCXM

(3) The area of a trapezium is 88 cm^2, its height is 8 cm and the length of one of the two parallel base 10 cm, find the length of the other base.

<u>(4) In the opposite figure:</u>

$\overline{AD}$ // $\overline{BC}$ area of Δ AXB = area of Δ DYC

Prove that: $\overline{XY}$ // $\overline{AD}$



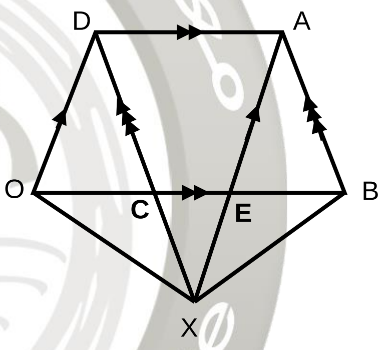
<u>(5) In the opposite figure:</u>

ABCD , AEOD area two parallelograms

$\overrightarrow{AE} \cap \overrightarrow{DC} = \{X\}$

Prove that

Area of Δ ABX equals area of Δ DOX

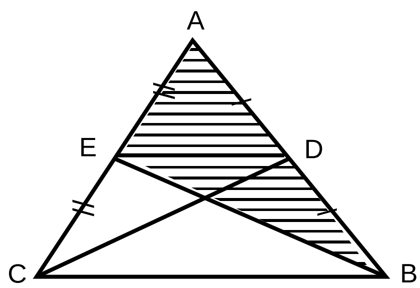


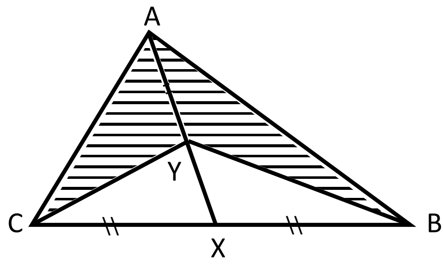
(6) Two pieces of land have equal areas, one of them has the shape of a square and the other has the shape of trapezium with two parallel bases of lengths 7 m, 11 m and height of 4m find the perimeter of the square land.

<u>(7) In the opposite figure</u>

If area of (Δ ADC) = are of (Δ AEB)

Prove that $\overline{DE}$ // $\overline{BC}$



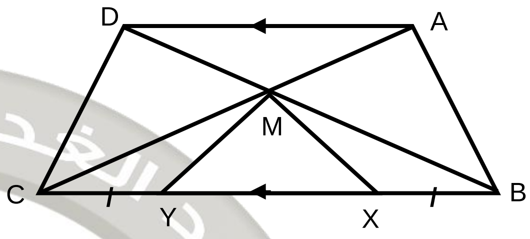


(8) In the opposite figure:

$\overline{AX}$ is a median in Δ ABC

, $Y \in \overline{AX}$, $\overline{BY}$, $\overline{CY}$ are drawn prove that

area of (Δ ABY) = area of (Δ ACY)



(9) In the opposite figure:

$\overline{AD}$ // $\overline{BC}$, $\overline{AC} \cap \overline{BD}$ = {M}

$X , Y \in \overline{BC}$ such that BX = CY

Prove that:

area of shape ABXM = area of shape DCYM

(10) ABCD is a parallelogram in which $\overline{DE} \perp \overline{BC}$, $\overline{DO} \perp \overline{AB}$

if AB = 4 cm, BC = 6 cm , DE = 3 cm find the length of $\overline{DO}$

Part (2)

First : Complete the following:

1) If $\overline{AB} \perp \overline{BC}$ then the projection of $\overline{AC}$ on $\overleftrightarrow{BC}$ is ……..

2) In Δ ABC if $(AB)^2 = (BC)^2 + (AC)^2$ then m ($\angle$ …....) = 90°

3) The two polygons are similar to a third are ………..

4) The two triangles are similar if its corresponding angles are …….. in measure.

5) ABC is a right angled triangle at B in which AB = 5 cm, BC = 12 cm then AC = …….. cm.

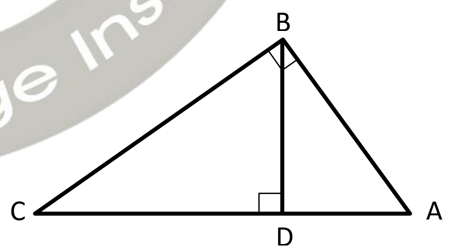
6) The projection of a point which belongs to a straight line on this line is ………....

7) In Δ ABC if $(AC)^2 + (AB)^2 < (BC)^2$ then angle A is ……….

8) In Δ XYZ if $(ZX)^2 + (YZ)^2 > (XY)^2$ then angle Z is …………

9) In the opposite figure:

Δ ABC is right angle triangle at B, $\overline{BD} \perp \overline{AC}$



a) The projection of $\overline{AB}$ on $\overleftrightarrow{AC}$ is

b) $(AB)^2$ = AD × ………

c) $(BD)^2$ = AD × ………

d) $(BC)^2$ = CD × ………

e) Δ ABC ~ Δ ……… ~ Δ ………

10) In the opposite figure:

If Δ AED ~ Δ ABC, AD = 3 cm, AE = 4 cm,

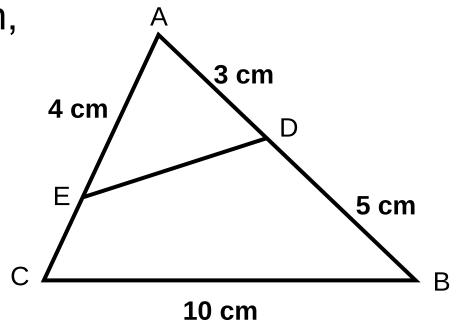
BC = 10 cm , BD = 5 cm then

a) m ($\angle$ ADE) = m ($\angle$ ………)

b) m ($\angle$ BAC) = m ($\angle$ ………)

c) DE = ………. cm

d) EC = ……… cm



11) The area of a rectangle whose length of one of its dimensions = 12 cm, its diagonal = 13 cm equal ………….

12) The triangle of side length 3 cm, 4 cm, 5 cm is ……… angled triangle.

13) Two triangles are similar one of them has sides length 9 cm, 12 cm, 16 cm and the perimeter of the other 148 cm then side lengths of the other triangle are …………. , …………. , ………….

Second: Choose the correct answer:

1) If Δ ABC ~ Δ DEO, AB = $\frac{1}{4}$ DE then the perimeter of Δ ABC equals ……….. the perimeter of Δ DEO.

a) 4 b) 2 c) $\frac{1}{2}$ d) $\frac{1}{4}$

2) The length of the projection of a given line segment ………… the length of the original line segment.

a) $\geq$ b) $>$ c) $\leq$ d) $<$

3) ABC is an obtuse angle triangle at A in which AB = 5 cm, BC = 8 cm then AC = ………… cm

a) 5 b) 7 c) 8 d) 13

4) The triangle whose sides length are 3 cm, 4 cm, 5 cm its area = … cm^2

a) 12 b) 10 c) 8 d) 6

5) If the ratio of enlargement between two similar triangles equals …………. then the two triangles are congruent.

a) 1 b) 2 c) 0.5 d) 0.25

6) Δ ABC in which $(AC)^2 = (BC)^2 - (AB)^2$ then angle A is …………

a) acute b) right c) obtuse d) straight

7) The triangle whose sides length are 5 cm, 12 cm, 13 cm its area = ………… cm^2

a) 30 b) 32.5 c) 78 d) 144

8) Δ ABC is obtuse angle triangle at B and AB = 3 cm, BC = 5 cm then AC = …………

a) 8 cm b) 7 cm c) 15 cm d) 4 cm

9) In the two similar polygons their corresponding angles are ……… in measure.

a) equal b) difference c) proportional d) alternatives

10) The perpendicular segment drawn from the right angle of a triangle to the hypotenuse divides it to two triangles.

a) obtuse angle b) acute angle

c) equal's sides triangle d) similar

11) ABC is a triangle in which $\overline{AD} \perp \overline{BC}$ then the projection of $\overline{AB}$ on $\overleftrightarrow{BC}$ is …………

a) $\overline{BD}$ b) $\overline{DC}$ c) $\overline{AC}$ d) $\overline{AB}$

12) Δ ABC in which $(AB)^2 + (BC)^2 < (AC)^2$ then $\angle$ B is …………

a) acute b) right c) obtuse d) reflex

13) The diagonal of a square whose area 50 cm^2 equals …………

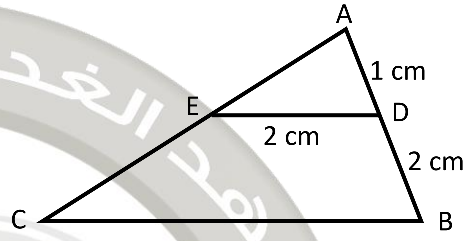
a) 10 cm b) 20 cm c) 30 cm d) 40 cm

14) Δ ABC in which $(AB)^2 = (AC)^2 + (BC)^2$, m ($\angle$ B) = 40° then m ($\angle$ A) = …………

a) 40° b) 50° c) 90° d) 130°

15) In the opposite figure:

If Δ ADE ~ Δ ABC then the length of $\overline{BC}$ in cm equals ……….



a) 3 b) 4

c) 6 d) 8

<u>Third: Essay question:</u>

(1) Determine the type of the angle B in ΔABC in each of the following:

a) AB = 7 cm , BC = 12 cm , AC = 8 cm

b) AB = 5 cm , BC = 8 cm , AC = 11 cm

c) AB = 6 cm , BC = 3.6 cm , AC = 4.6 cm

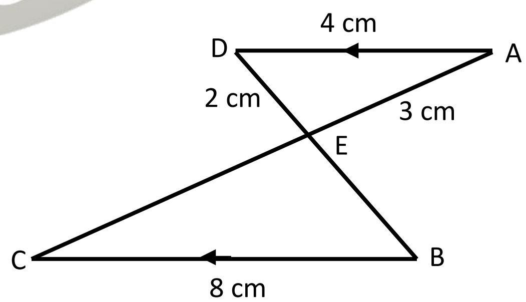
(2) In the opposite figure:

$\overline{AD}$ // $\overline{BC}$, AD = 4 cm, BC = 8 cm ,

AE = 3 cm, ED = 2 cm

i) Prove that Δ AED ~ Δ CEB

ii) Find the perimeter of Δ EBC



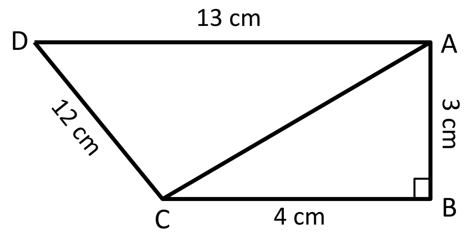
(3) In the opposite figure:

AB = 3 cm , BC = 4 cm ,

AD = 13 cm, CD = 12 cm

m (∠ B) = 90°

Prove that m (∠ ACD) = 90°



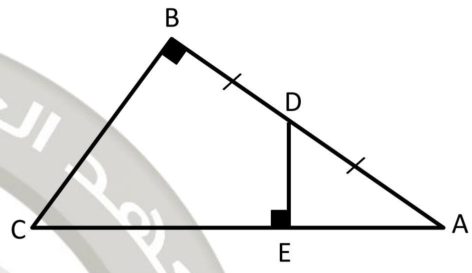
(4) In the opposite figure:

ABC is right angle triangle at B,

D is the midpoint

of $\overline{AB}$, $\overline{DE} \perp \overline{AC}$, AB = 8 cm, BC = 6 cm

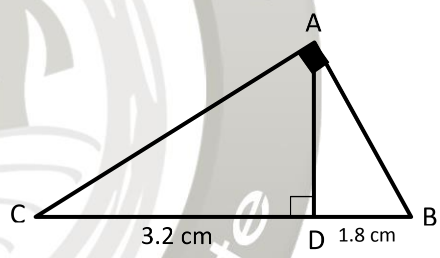
Find the length of $\overline{DE}$



(5) In the opposite figure:

BD = 1.8 cm, DC = 3.2 cm

Find the lengths of each $\overline{AC}$, $\overline{AD}$



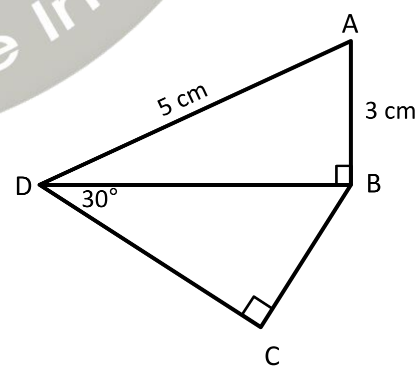
(6) In the opposite figure:

ABCD is quadrilateral in which

m (∠ ABD) = 90°, m (∠ BCD) = 90°,

m (∠ BDC) = 30°,

AB = 3 cm , AD = 5 cm find $\overline{BC}$



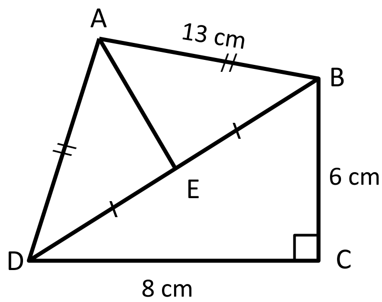
(7) In the opposite figure:

ABCD is a quadrilateral in which m ($\angle$ C) = 90°

AB = AD = 13 cm, BC = 6 cm, CD = 8 cm

E is midpoint of $\overline{BD}$

Find the area of the shape ABCD



(8) In the opposite figure:

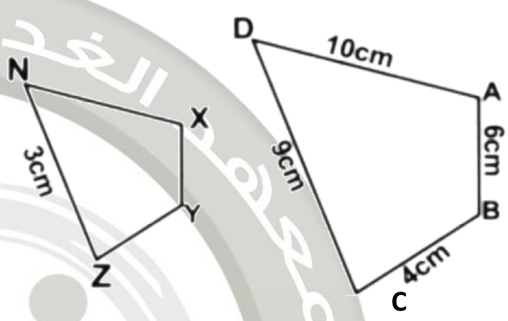
The polygon ABCD

is similar to the polygon XYZN ,

AB = 6 cm , BC = 4 cm ,

CD = 9 cm , DA = 10 cm

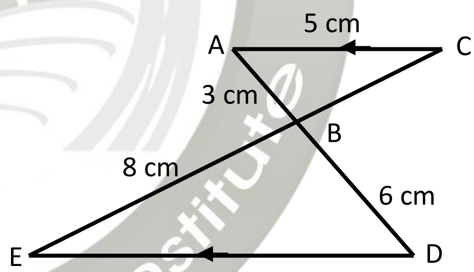
, ZN = 3 cm find the lengths of $\overline{XY}$, $\overline{YZ}$, $\overline{XN}$



(9) In the opposite figure:

i) Prove that Δ ABC is similar Δ DBE

ii) Find the length of $\overline{BC}$, $\overline{DE}$



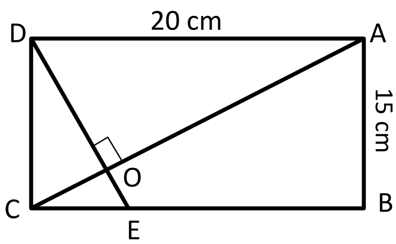
(10) In the opposite figure:

ABCD is a rectangle $\overline{DE} \perp \overline{AC}$

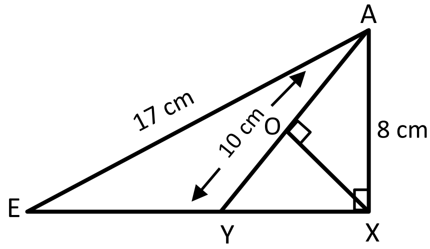
, DE intersect AC at O and intersect BC at E

If AB = 15 cm, AD = 20 cm

Find the lengths of each $\overline{AO}$, $\overline{CE}$



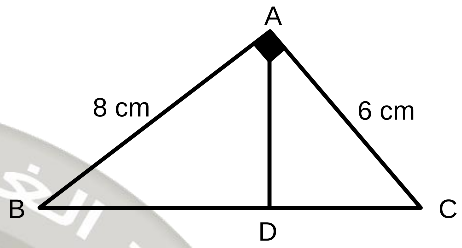
(11) In the opposite figure:



i) Find the length of projection of $\overline{AY}$ on $\overleftrightarrow{XE}$

ii) Find the length of $\overline{XO}$, $\overline{AO}$

(12) In the opposite figure:



Δ DBA ~ Δ ABC , m ($\angle$ BAC) = 90°

Prove that: $\overline{AD} \perp \overline{BC}$

Find BD if AB = 8 cm , AC = 6 cm

(13) A piece of land has a rectangle shape whose length twice its width and its area 200 meter square is drawn by a scale 1:200 find the dimensions of this land at the drawing.

Model Answers

Part (1)

(1) Complete:

1) 30 cm^2

2) equal.

3) 48 cm^2.

4) equal.

5) $\frac{1}{2}$ (6 + 10) × 5 = 40 cm^2

6) Their vertices lie on a straight line parallel to this base.

7) one is carrying this base are equal in area.

8) Two triangular surface equal in area.

9) the length of the base X its corresponding height.

10) Area.

11) $\frac{1}{2}$ XY cm^2.

12) $\frac{1}{2}$ × 6 × 8 = 24 cm^2

13) 9 × 6 = 54 cm^2

14) equal in measure

15) 6 cm.

16) the middle base = $\frac{1}{2}$ (5 + 7) = 6 cm

H = 42 ÷ 6 = 7 cm.

17) b = 20 ÷ 4 = 5 cm

A = 5 × 4 = 20 cm^2

18) 10 cm.

19) A. of rectangle = 9 × 16 = 144 cm^2

S. of square = $\sqrt{144}$ = 12cm.

20) 30 ÷ 5 = 6cm.

(2) Choose the correct answer:-

1) (b)	2) (c)	3) (a)	4) (d)
5) (a)	6) (d)	7) (d)	8) (d)
9) (c)	10) (d)	11) (c)	12) (a)
13) (b)	14) (d)	15) (b)	

(3)

(1) Proof: ∵ ABCD is a rectangle, ABEO is a parallelogram

▭ ABCD , ▱ ABEO have common base $\overline{AB}$

∵ $\overline{AB}$ // $\overline{OC}$

∴ Area of ▭ ABCD = Area of ▱ ABEO

∵ AB = 3 cm , BC = 10 cm

∴ Area of ▭ ABCD = 3 × 10 = 30 cm^2

∴ Area of ▱ ABEO = 30 cm^2

∵ In Δ AXO , ▱ ABEO have common base $\overline{AO}$

, $\overline{AO}$ // $\overline{BE}$

∴ Area of Δ AXO = $\frac{1}{2}$ area of ▱ ABEO

= $\frac{1}{2}$ x 30 = 15 cm

(2) Proof: ∵ $\overline{AD}$ // $\overline{BC}$

In Δ ACD , Δ ADB have common base $\overline{AD}$

∴ Area of Δ ACD = Area of Δ ADB (1)

subtracting A. of Δ AMD from (1)

∴ Area of Δ DMC = Area of Δ AMB (2)

∵ X midpoint of $\overline{BC}$

∴ Area of Δ MXC = Area of Δ MXB (3)

Adding (2) & (3)

∴ Area of the shape DCXM = Area of the shape ABXM

(3) Area of trapezium = $\frac{1}{2}(b_1 + b_2) \times h$

$88 = \frac{1}{2}(10 + b_2) \times 8$

$b_2 = 12$ cm

(4) $\because \overline{AD} \parallel \overline{BC}$

In Δ ADB , Δ ADC have common base $\overline{AD}$

∴ Area of Δ ADB = Area of Δ ADC (1)

∵ Area of Δ AXB = Area of Δ DYC (2)

subtracting (2) from (1)

∴ Area of Δ ADX = Area of Δ AYD (3)

have a common base $\overline{AD}$

$\therefore \overline{XY} \parallel \overline{AD}$

(5) ∵ ABCD , AEOD are two parallelogram

, $\overline{AD}$ is a common base

∴ Area of ▱ ABCD = Area of ▱ AEOD (1)

subtracting Area of the figure AECD from (1)

∴ Area of Δ ABE = Area of Δ DCO (2)

∴ OC = EB

∵ in Δ XCO , Δ XEB have common vertex X

, EB = CO

∴ Area of Δ XBE = Area of Δ XCO (3)

Adding (2) & (3)

∴ Area of Δ ABX = Area of Δ DOX

(6) Area of trapezium = $\frac{1}{2}(b_1 + b_2) \times h$

$= \frac{1}{2}(7 + 11) \times 4$

$= 36\ cm^3$.

Area of square = $36\ cm^3$.

$S = \sqrt{36} = 6$ cm.

Perimeter of square = $6 \times 4 = 24\ cm^2$

(7) Proof: ∵ Area of Δ ADC = Area of Δ AEB

subtracting Area of Δ ADE from both side

∴ Area of Δ EDC = Area of Δ DEB

, $\overline{ED}$ is a common base

∴ $\overline{ED} \parallel \overline{BC}$

(8) Proof: ∵ In Δ ABC

X is midpoint

∴ A. of Δ ABX = A. of Δ AXC (1)

∵ In Δ YBC

X is midpoint

∴ A. of Δ YBX = A. of Δ YXC (2)

subtracting (2) from (1)

∴ A. of Δ ABY = A. of Δ ACY .

(9) Proof: ∵ In Δ ABD , Δ ACD

$\overline{AD}$ // $\overline{BC}$, $\overline{AD}$ is a common base .

∴ Area of Δ ABD = Area of Δ ADC (1)

By subtracting Area of Δ AMD from both side

∴ Area of Δ AMB = Area of Δ DMC (2)

∵ Δ MXB , Δ MYC

M is a common vertex, XB = YC

∴ Area of Δ MXB = A. of Δ MYC (3)

Adding (2) & (3)

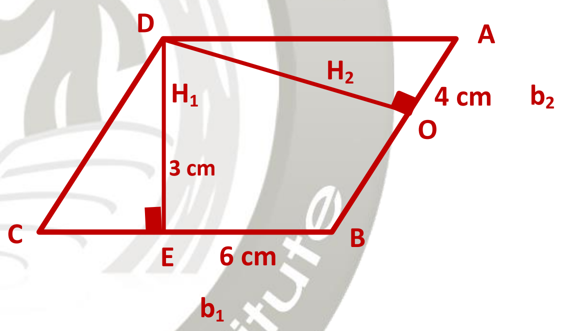
∴ Area of shape ABXM = Area of shape DCYM

(10) Area of parallelogram

$= b_1 \times h_1 = 3 \times 6 = 18 \text{ cm}^2$

$A = b_2 \times h_2 = 4 \times h_2 = 18 \text{ cm}^2$

h_2 (DO) = 18 ÷ 4 = 4.5 cm



Part (2)

First: Complete:

1) $\overline{BC}$
2) ($\angle$ C)
3) similar
4) equal
5) 13 cm
6) the same point
7) obtuse
8) acute
9) a) $\overline{AC}$ b) AC c) DC d) $\overline{CA}$ e) Δ ADB - Δ BDC
10) a) m ($\angle$ ACB) b) m ($\angle$ EAD) c) 5 cm d) 2 cm
11) 60 cm^2
12) right
13) 36 cm , 48 cm , 64 cm

Second: Choose:

1) d	2) c	3) a	4) d	5) a
6) b	7) a	8) b	9) a	10) d
11) a	12) a	13) a	14) b	15) c

Third: Essay Question

(1) a) obtuse b) obtuse c) obtuse

(2) $\because \overline{AD} \parallel \overline{BC}$, $\overline{AC}$ & $\overline{DB}$ are transversals

$\therefore$ m ($\angle$ D) = m ($\angle$ B)

m ($\angle$ A) = m ($\angle$ C) alternate angles $\rightarrow$ (1)

$\because \overleftrightarrow{DB} \cap \overleftrightarrow{AC} = \{ E \}$

$\therefore$ m ($\angle$ DEA) = m ($\angle$ BEC) V.O.A $\rightarrow$ (2)

From (1) & (2)

$\therefore \Delta$ ADE ~ Δ CBE

$$\therefore \frac{AD}{CB} = \frac{DE}{BE} = \frac{AE}{CE} = \frac{P.of\,\Delta\,ADE}{P.of\,\Delta\,CBE}$$

$\therefore \frac{4}{8} = \frac{2}{BE} = \frac{3}{CE} = \frac{4+2+3}{P.of\,\Delta\, CBE}$

P. of Δ CBE = $\frac{9 \times 8}{4}$ = 18 cm

(3) In Δ ABC: ∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2$ (Pythagoras)

AC = $\sqrt{(3)^2 + (4)^2}$ = 5 cm

In Δ ACD

∵ $(AD)^2 = (13)^2 = 169$,

$(AC)^2 = 25$, $(CD)^2 = 144$

∴ $(AD)^2 = (AC)^2 + (CD)^2$

∴ m (∠ ACD) = 90° (converse of Pythagoras theory)

(4) In Δ ABC: ∵ (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = 64 + 36 = 100$

∴ AC = 10 cm

, ∵ D is the midpoint of $\overline{AB}$

∴ AD = DB = 4 cm

In ΔΔ AED , ABC

m (∠ AED) = m (∠ B) = 90° (given)

, ∠ A is common

∴ m (∠ ADE) = m (∠ ACB)

∴ Δ AED ~ Δ ABC

$\therefore \frac{DE}{CB} = \frac{AD}{AC}$, $\therefore \frac{DE}{6} = \frac{4}{10}$

∴ DE = $\frac{6 \times 4}{10}$ = 2.4 cm

(5) In Δ ABC :

$\because$ m ($\angle$ A) = 90° , $\overline{AD} \perp \overline{CB}$

$\therefore$ $(AC)^2$ = CD × CB = 3.2 × 5 = 16 (Euclidean theorem)

AC = 4 cm

$(AD)^2$ = DB × DC = 1.8 × 3.2 = 5.76

AD = 2.4 cm

(6) In Δ ABD: $\because$ m ($\angle$ B) = 90°

$\therefore$ (BD) = $\sqrt{(5)^2 - (3)^2}$ = 4 cm (Pythagoras theorem)

In Δ BCD: $\because$ m ($\angle$ C) = 90° , m ($\angle$ CDB) = 30°

$\therefore$ CB = $\frac{1}{2}$ BD = $\frac{1}{2}$ × 4 = 2 cm

(7) In Δ BCD: $\because$ m ($\angle$ C) = 90°

$\therefore$ BD = $\sqrt{(BC)^2 + (CD)^2}$ = $\sqrt{(6)^2 + (8)^2}$ = 10 cm (Pythagoras Theorem)

In Δ ABD: E is a midpoint of $\overline{BD}$, AB = AD

$\therefore$ AE $\perp$ BD , EB = 5 cm

$\therefore$ AE = $\sqrt{(AB)^2 - (EB)^2}$ = $\sqrt{(13)^2 - (5)^2}$ = 12 cm

$\because$ The area of the quadrilateral ABCD =

Area of Δ BCD + Area of Δ ABD

$\therefore$ Area = $\frac{1}{2}$ × DC × BC + $\frac{1}{2}$ × BD × AE

= $\frac{1}{2}$ × 8 × 6 + $\frac{1}{2}$ × 10 × 12 = 24 + 60 = 84 cm^2

(8) $\because$ Polygon ABCD ~ Polygon XYZN

$\therefore$ $\frac{AB}{XY} = \frac{BC}{YZ} = \frac{CD}{ZN} = \frac{AD}{XN}$

$\frac{6}{XY} = \frac{4}{YZ} = \frac{9}{ZN} = \frac{10}{XN}$

XY = 2 cm , YZ = 1 $\frac{1}{3}$ cm , XN = 3 $\frac{1}{3}$ cm

(9) $\because \overline{AC}$ // ED , $\overleftrightarrow{AD}$ & $\overleftrightarrow{CE}$ are transversals

$\therefore$ m ($\angle$ A) = m ($\angle$ D)

m ($\angle$ C) = m ($\angle$ E) alternate angles $\rightarrow$ (1)

$\because \overleftrightarrow{AD} \cap \overleftrightarrow{CE}$ = { B } , $\therefore$ m ($\angle$ ABC) = m ($\angle$ EBD) V.O.A $\rightarrow$ (2)

From (1) & (2)

$\therefore \Delta$ ABC ~ Δ DBE

$\therefore \frac{AB}{DB} = \frac{BC}{BE} = \frac{CA}{ED} = \frac{3}{6} = \frac{BC}{8} = \frac{5}{ED}$,

BC = 4 cm , ED = 10 cm

(10) In Δ ABC: $\because$ ($\angle$ B) = 90°

$\therefore$ AC = $\sqrt{(AB)^2 + (BC)^2} = \sqrt{(15)^2 + (20)^2}$ = 25 cm (Pythagoras)

In Δ ADC: $\because$ ($\angle$ D) = 90°

$\therefore$ $(DA)^2$ = AO × AC (Euclidean Theorem)

$\therefore$ AO = $\frac{(20)^2}{25}$ = 16 cm

$\therefore$ DO = $\frac{DA \times DC}{AC} = \frac{20 \times 15}{25}$ = 12 cm

$\because \Delta$ DCE is right angled at C , $\overline{CO} \perp \overline{DE}$

$\therefore$ $(CD)^2$ = DO × DE $\rightarrow$ DE = $\frac{(15)^2}{12}$ = 18.75 cm

OE = 18.75 - 12 = 6.75 cm

$(CE)^2$ = EO × ED = 6.75 × 18.75 = 126.5625 cm^2

CE = 11.25 cm

(11) $\because$ $\overline{XY}$ is the projection of $\overline{AY}$ on $\overleftrightarrow{XE}$, Δ AXY is right angled

$\therefore$ $(XY)^2 = (AY)^2 - (AX)^2 = 100 - 64 = 36$, XY = 6 cm

$\because$ $\overline{XO} \perp \overline{AY}$, XO = $\frac{AX \times XY}{AY} = \frac{6 \times 8}{10}$ = 4.8 cm

$(AX)^2$ = AO × AY , AO = 6.4 cm

(12) $\because$ Δ ABC is right angled at A , $\therefore$ BC = $\sqrt{8^2 + 6^2}$ = 10 cm

$\because$ Δ DBA ~ Δ ABC , $\therefore$ m ($\angle$ BDA) = m ($\angle$ BAC) = 90°

$\therefore$ $\overline{AD} \perp \overline{BC}$, $\therefore$ $(BA)^2$ = BD × BC , BD = $\frac{64}{10}$ = 6.4 cm

(13) Let the real length be = 2x , width = x

A = L × w = 2 x × x = $2x^2$ = 200 m → x = 10 cm , 2x = 20 m

Length in drawing = $\frac{2000 \times 1}{200}$ = 10 cm D.L : R.L

Width in drawing = $\frac{1000 \times 1}{200}$ = 5 cm 1 : 200