

PONY

سلسلة كتب الأستاذ

Math

February Revision



مذكرتي
Mozkrty.com

2st preparatory

Second
Term

By Mohamed Nasr Eldin

First Algebra

Model

1

Q1) Choose the correct answer from those given:

1. If $(x - 1)$ is one factor of the expression : $x^2 - 4x + 3$, then the other factor is

- a** $x - 3$ **b** $x + 1$ **c** $x - 4$ **d** $x + 3$

2. If the expression : $x^2 - cx + 12$ can be factorized , when $c =$

- a** $- 1$ **b** 4 **c** 7 **d** 1

3. If the expression : $x^2 + 5x + m$ can be factorized , when $m =$

- a** 12 **b** 7 **c** $- 14$ **d** $- 2$

4. If $x^2 - 2xy + y^2 = 25$, then $(x - y) =$

- a** 25 **b** 5 **c** $- 5$ **d** ± 5

5. If $x^2 + kx + 25$ is a perfect square ,then $k =$

- a** 5 **b** 10 **c** ± 10 **d** ± 5

Q2) Answer the following questions :

1. Factorize each of the following:

- ax^2 - 3x - 10 = **b2x^2 + 3x + 1 =****

2. Factorize each of the following:

- ax^2 - 12x + 36 = **bx^2 - 4 =****

3. Factorize each of the following:

- ax^3 + 8 =
bax + bx + ay + by = =**

4. If $x - y = 2$, $x + y = 7$, then find the value of $x^2 - y^2$.

.....

5. Use factorization to find the value of: $(7.8)^2 + 2 \times 7.8 \times 2.2 + (2.2)^2$

.....

Model

2

Q1) Choose the correct answer from those given:

1. If $x^3 - y^3 = 35$, and $x^2 + xy + y^2 = 7$, then $x - y =$

- a** 28 **b** 21 **c** 15 **d** 5

2. If the expression : $x^2 - cx - 12$ can't be factorized , when $c =$

- a** - 1 **b** 4 **c** 7 **d** 1

3. If : $9x^2 - kx + 4$ is perfect square then $k =$

- a** 12 **b** 7 **c** - 6 **d** - 2

4. If $x^2 + 2xy + y^2 = 36$, then $(x + y) =$

- a** - 6 **b** 6 **c** ± 6 **d** 36

5. $x^3 + 27 = (x + 3) ($

- a** $x^2 - 6x + 9$ **b** $x^2 - 3x + 9$ **c** $x^2 - 9$ **d** $x^2 + 6x + 9$

Q2) Answer the following questions :

1. Factorize each of the following:

a) $x^2 + x - 12 =$

b) $2x^2 + 3x - 5 =$

2. Factorize each of the following:

a) $x^2 - 8x + 16 =$

b) $4x^2 - 9 =$

3. Factorize each of the following:

a) $x^3 - 64 =$

b) $xy + 5y + 7x + 35 =$ =

4. If $x^2 - y^2 = 24$, $x + y = 8$, then find the value of $x - y$.

.....

5. Use factorization to find the value of : $(7.2)^2 - 2 \times 7.2 \times 2.2 + (2.2)^2$

.....

Q1) Choose the correct answer from those given:

1. If: $a + b = 5$ and $x + y = 9$, then $ax + bx + ay + by =$

- a** 14 **b** 1.8 **c** 45 **d** 90

2. If the expression : $x^2 - 2x - c$ can be factorized , when $c =$

- a** - 1 **b** - 3 **c** - 15 **d** 1

3. If: $4x^2 - kx + 4$ is perfect square then k can be equal

- a** 0 **b** 4 **c** - 8 **d** - 2

4. The rectangle whose area is $(x^2 - 7x + 6)$ square unit and its length is $(x - 6)$ length unit ,then its width is length unit.

- a** $x - 6$ **b** $x + 1$ **c** $x - 1$ **d** $x + 6$

5. $x^3 + 216 = (x + 6) ($ $)$

- a** $x^2 - 6x + 36$ **b** $x^2 - 3x + 36$ **c** $x^2 - 36$ **d** $x^2 + 6x + 36$

Q2) Answer the following questions :

1. Factorize each of the following:

a) $x^2 + x - 6 =$

b) $2x^2 + 3x - 9 =$

2. Factorize each of the following:

a) $x^2 - 18x + 81 =$

b) $x^2 - 16 =$

3. Factorize each of the following:

a) $x^3 + 8 =$

b) $xy + 5y - 7x - 35 =$ =

4. If $x - y = 4$, $x + y = 8$, then find the value of $x^2 - y^2$

.....

5. Use factorization to find the value of : $(5.4)^2 + 2 \times 5.4 \times 1.6 + (1.6)^2$

.....

Model

4

Q1) Choose the correct answer from those given:

1. If $(2x + 3)$ is one factor of the expression : $2x^2 - 5x - 12$, then the other factor is

- a** $x - 3$ **b** $x + 4$ **c** $x - 4$ **d** $x - 8$

2. If the expression : $x^2 + c = (x - 5)(x + 5)$, then $c =$

- a** -25 **b** 25 **c** ± 25 **d** -10

3. If the expression : $x^2 + 3x + m$ can be factorized , when $m =$

- a** -2 **b** 10 **c** -4 **d** 28

4. If $x^3 - y^3 = 26$, , $(x - y) = 2$ then $(x^2 + xy + y^2) =$

- a** 52 **b** 24 **c** 13 **d** 11

5. If $x^2 + kx + 100$ is a perfect square ,then $k =$

- a** ± 10 **b** ± 20 **c** ± 25 **d** ± 40

Q2) Answer the following questions :

1. Factorize each of the following:

a) $x^2 - 13x + 36 =$

b) $3x^2 + 13x - 10 =$

2. Factorize each of the following:

a) $9x^2 - 24x + 16 =$

b) $2x^2 - 50 =$

3. Factorize each of the following:

a) $x^3 + 125 =$

b) $5n - 10m - an + 2am =$ =

4. If $(x - y)^2 = 25$, $x + y = 7$, then find the value of $x^2 - y^2$.

.....

5. Use factorization to find the value of : $(1.9)^2 + 2 \times 1.9 \times 0.1 + (0.1)^2$

.....

Q1) Choose the correct answer from those given:

1. If $x^2 + y^2 = 25$, $xy = 12$, then find the value of $x + y$

- a ± 1 b ± 5 c ± 7 d ± 8

2. If the expression : $x^3 + c = (x - 5)(x^2 + 5x + 25)$, then $c =$

- a - 25 b 125 c 25 d -125

3. If the expression : $x^2 + 11x + m$ can be factorized , when $m =$

- a -10 b 11 c -18 d 28

4. If $x^2 - y^2 = 24$, , $(x - y) = 4$ then $(x + y)^2 =$

- a 72 b 36 c 12 d 6

5. If $x^2 + kx + 64$ is a perfect square ,then $k =$

- a ± 8 b ± 16 c ± 32 d ± 4

Q2) Answer the following questions :

1. Factorize each of the following:

a) $x^2 - 9x - 10 =$

b) $2x^2 + 3x - 20 =$

2. Factorize each of the following:

a) $25x^2 - 40x + 16 =$

b) $3x^2 - 48 =$

3. Factorize each of the following:

a) $x^3 + 8 =$

b) $3ax - a - 6bx + 2b =$ =

4. If $(x + 2)$ is one factor of the expression : $4x^2 + 5x - 6$, then find the other factor

.....

5) Use factorization to find the value of : $(9.1)^2 - 2 \times 9.1 \times 0.1 + (0.1)^2$

.....



Second Geometry

Model 1

Q1) Choose the correct answer from those given:

1. The area of the triangle is the area of the parallelogram which has a common base with it and its vertex lies on the straight line parallel to this base.

- a Equal to b half c twice d quarter

2. The area of a right-angled triangle in which the lengths of the sides of the right angle are 6 cm. and 9 cm. equals cm²

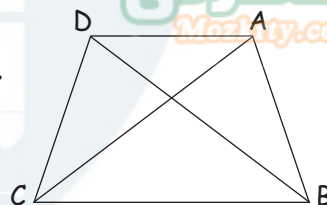
- a 54 b 60 c 27 d 15

3. If ABCD is a parallelogram, $E \in \overline{AD}$ and the area of $\triangle EBC = 35 \text{ cm}^2$, then the area of ABCD = cm²

- a 35 b 70 c 17 d 17.5

4. In the opposite figure:
If the area of $\triangle ABC =$ the area of $\triangle DBC$, then .

- a $\overline{AB} \parallel \overline{CD}$ b $\overline{AD} \parallel \overline{BC}$
c $AB = CD$ d $AD = BC$



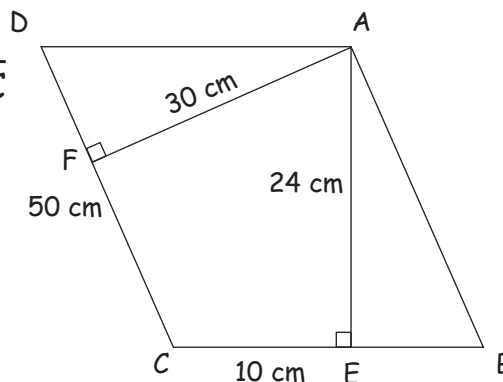
5. If the lengths of two adjacent sides of a parallelogram are 9 cm. and 7 cm. and its smaller height is 4 cm. , then its area equals cm²

- a 14 b 18 c 28 d 36

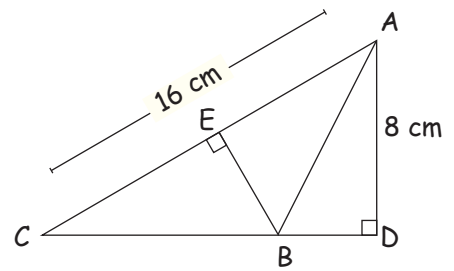
Q2) Answer the following questions :

1. In the opposite figure: ABCD is a parallelogram. Find the length of \overline{BC}

.....

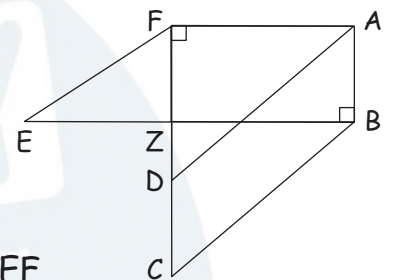


2. In the opposite figure:
 $\overline{AD} \perp \overline{CB}$, $\overline{BE} \perp \overline{AC}$, $AC = 16$ cm,
 $BC = 10$ cm and $AD = 8$ cm.



- Find: a) Area of $\triangle ABC$
 b) The length of \overline{BC}

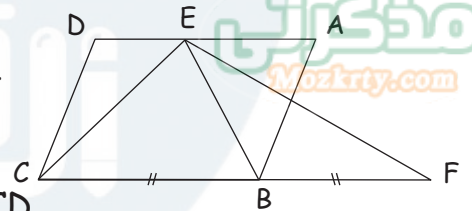
3. In the opposite figure : $\overline{AB} \parallel \overline{CF}$, $\overline{AF} \parallel \overline{BE}$
 $ABZF$ is a rectangle , $ABCD$, $AMEF$ are two
 parallelograms.



Prove that :

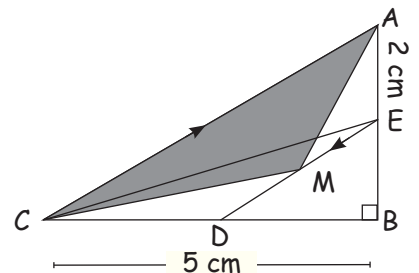
The area of $\square ABCD =$ the area of $\square AMEF$

4. In the opposite figure :
 $ABCD$ is a parallelogram , B is the midpoint
 of \overline{CF} , Prove that :



The area of $\triangle EFC =$ the area of $\square ABCD$

5. In the opposite figure:
 $\triangle ABC$ is right at B , $\overline{ED} \parallel \overline{AC}$
 $AE = 2$ cm , $BC = 5$ cm
 Find area of $\triangle AMC$



Model 2

Q1) Choose the correct answer from those given:

1. The ratio between the area of the parallelogram and the area of the triangle whose base is common and is included between two parallel straight lines =

- a** 1 : 2 **b** 1 : 3 **c** 2 : 1 **d** 2 : 3

2. If the base length of a parallelogram is 7 cm. and the corresponding height is 5 cm., then its area equals cm^2

- a** 13 **b** 35 **c** 24 **d** 12

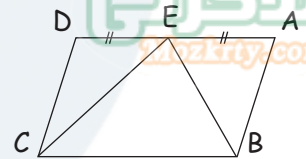
3. The area of a triangle is the area of a parallelogram if they have a common base lying on one of two parallel straight lines including them.

- a** Equal to **b** half **c** twice **d** quarter

4. In the opposite figure :

If ABCD is a parallelogram , its area= 24cm^2 ,
then the area of $\triangle ABE =$ cm^2

- a** 24 **b** 12 **c** 8 **d** 6



5. The area of a triangle whose base 8 cm and its corresponding height is 5 cm equals cm^2 .

- a** 80 **b** 40 **c** 20 **d** 9

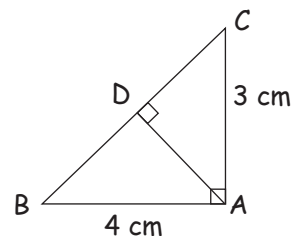
Q2) Answer the following questions :

1. In the opposite figure:

ABC is a right-angled triangle at A, $\overline{AD} \perp \overline{BC}$,

AB = 4 cm. and AC = 3 cm.

Find: a) The area of $\triangle ABC$ b) The length of \overline{AD}



.....

.....

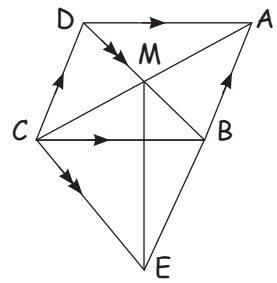
.....

2. In the opposite figure:

$ABCD$ and $BECD$ are two parallelograms,

Where $\overline{AC} \cap \overline{BD} = \{M\}$

Prove that: The area of $\triangle ABC =$ the area of $\triangle MEC$



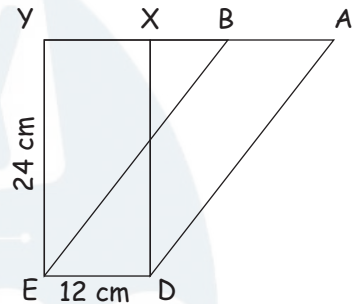
3. In the opposite figure:

$\overline{AY} \parallel \overline{DE}$ and $B, X \in \overline{AY}$, $XDEY$ is a rectangle and $\overline{AD} \parallel \overline{BE}$

Prove that:

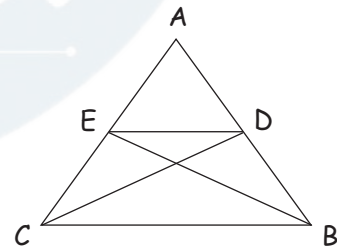
a) the area of figure $ABED =$ the area of rectangle $XYED$

b) Find the area of figure $ABED$, and If $AD=30$ cm. find the length of the perpendicular from B to \overline{AD}

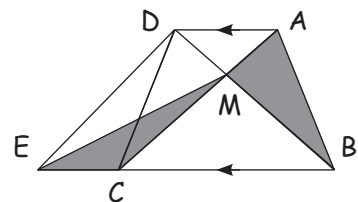


4. In the opposite figure:

ABC is a triangle, $D \in \overline{AB}$ and $E \in \overline{AC}$ such that: The area of $\triangle ABE =$ the area of $\triangle ACD$,
Prove that: $\overline{ED} \parallel \overline{BC}$



5. In the opposite figure: $\overline{AD} \parallel \overline{BC}$ and
The area of $\triangle ABM =$ the area of $\triangle MCE$
Prove that: $\overline{AC} \parallel \overline{DE}$



Model 3

Q1) Choose the correct answer from those given:

1. If the base length of a triangle is 4 cm. and the corresponding height is 3 cm. ,then its area = cm²

- a** 6 **b** 12 **c** 24 **d** 34

2. If the base length of a parallelogram is 8 cm. and the corresponding height is 3 cm., then its area equals cm²

- a** 13 **b** 35 **c** 24 **d** 12

3. The area of a triangle is the area of a parallelogram if they have a common base lying on one of two parallel straight lines including them.

- a** equal to **b** half **c** twice **d** quarter

4. The median of the triangle divides its surface into two triangles are

- a** equal in perimeter **b** similar
c equal in area **d** congruent.

5. In ΔABC : D is midpoint of \overline{BC} , Area of $\Delta ABD = 20 \text{ cm}^2$.then area of $\Delta ABC =$ cm²

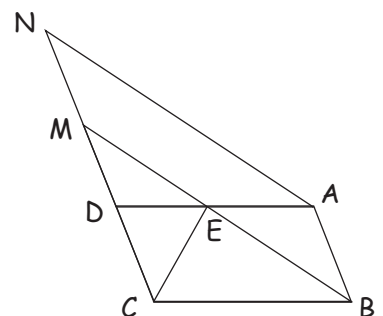
- a** 10 **b** 20 **c** 40 **d** 80

Q2) Answer the following questions:

1. ABCD and ABMN are two parallelograms, $M \in \overline{CD}$

Prove that:

The area of $\Delta EBC = \frac{1}{2}$ the area of \square ABMN



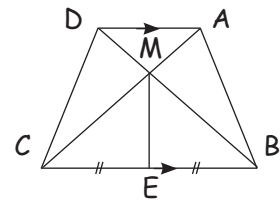
.....
.....

2. In the opposite figure:

$\overline{AD} \parallel \overline{BC}$ and E is midpoint of \overline{BC}

Prove that :

- a) The area of $\Delta AMB =$ the area of ΔDMC
- b) The area of figure $ABEM =$ the area of figure $DCEM$

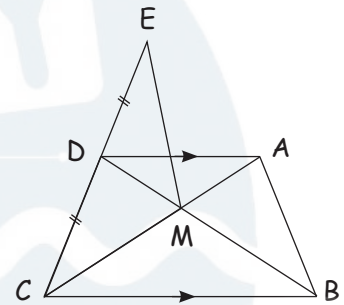


3. In the opposite figure:

$\overline{AD} \parallel \overline{BC}$ and D is midpoint of \overline{EC}

Prove that :

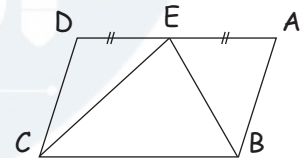
- a) The area of $\Delta MDE =$ the area of ΔAMB



4. In the opposite figure :

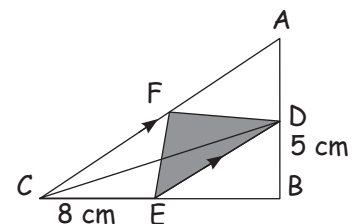
If $ABCD$ is a parallelogram ,
its area = 52 cm^2

Find with proof: the area of ΔABE



5. In the opposite figure:

ΔABC is right at B , $\overline{ED} \parallel \overline{AC}$
and $EC = 8 \text{ cm}$ Prove that : $\overline{AC} \parallel \overline{DE}$
Find with proof: the area of ΔFDE



Model 4

Q1) Choose the correct answer from those given:

1. If the lengths of two adjacent sides of a parallelogram are 8 cm. and 9 cm. and its greater height is 6 cm. , then its area equals cm²

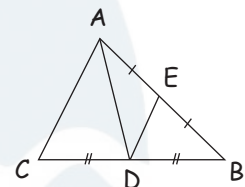
- a** 24 **b** 27 **c** 48 **d** 54

2. If the base length of a triangle is 6 cm. and the corresponding height is 5 cm. ,then its area =

- a** 5.5 **b** 11 **c** 15 **d** 30

3. In the opposite figure:

The area of $\triangle ABC$ = the area of $\triangle BED$



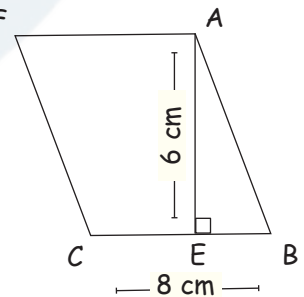
- a** $\frac{1}{2}$ **b** 2
c $\frac{1}{4}$ **d** 4

4. The area of a parallelogram is the area of a triangle if they have a common base and lies between two parallel straight lines including them.

- a** equal to **b** half **c** twice **d** quarter

5. In the opposite figure: if ABCD is a parallelogram

The area of = cm²

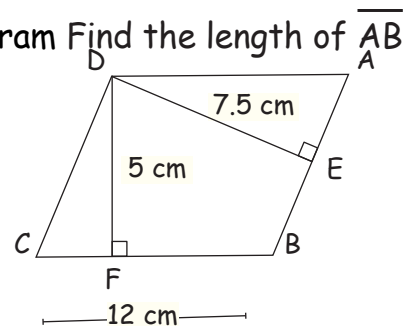


- a** 14 **b** 24
c 28 **d** 48

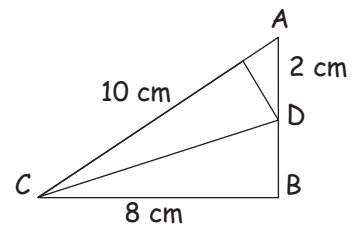
Q2) Answer the following questions:

1. In the opposite figure: if ABCD is a parallelogram Find the length of \overline{AB}

.....



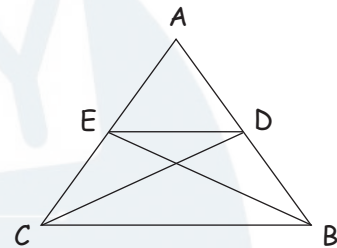
2. In the opposite figure: $\overline{AB} \perp \overline{CB}$, $\overline{DE} \perp \overline{AC}$, $AC = 10$ cm, $BC = 8$ cm and $AD = 2$ cm.



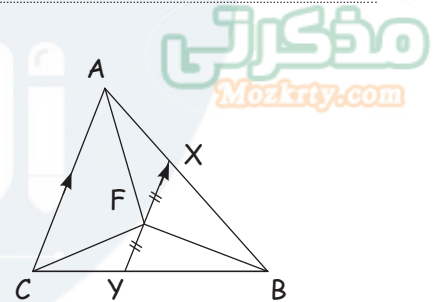
a) Prove that: The area of $\triangle ADC =$ the area of $\triangle ABC$

b) Find: The length of \overline{DE}

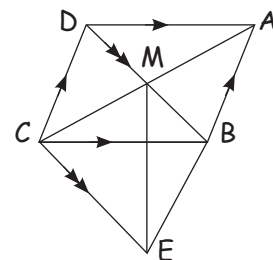
3. In the opposite figure :
 ABC is a triangle , $D \in \overline{AB}$ and $E \in \overline{AC}$
 such that : The area of $\triangle ABE =$ the area of $\triangle ACD$, Prove that : $\overline{ED} \parallel \overline{BC}$



4. In the opposite figure :
 $\overline{AC} \parallel \overline{XY}$, and F is midpoint of \overline{XY}
 Prove that:
 The area of $\triangle ABF =$ the area of $\triangle BCF$



5. In the opposite figure: $ABCD$ and $BECD$ are two parallelograms,
 Where $\overline{AC} \cap \overline{BD} = \{M\}$
 Prove that: The area of $\triangle ABC =$ the area of $\triangle MEC$



Model 5

Q1) Choose the correct answer from those given:

1. If the base length of a parallelogram is 4 cm. and the corresponding height is 6 cm. ,then its area =

- a** 6 **b** 12 **c** 24 **d** 34

2. If the area of a triangle is 54 cm² and its height is 6 cm. , then the length of its corresponding base equals cm.

- a** 9 **b** 12 **c** 18 **d** 15

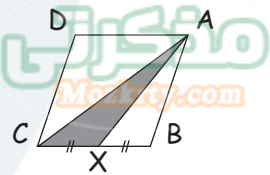
3. If ABCD is a parallelogram , E ∈ \overline{AD} and the area of $\triangle EBC = 42 \text{ cm}^2$, then the area of ABCD = cm²

- a** 42 **b** 84 **c** 21 **d** 10.5

4. In the opposite figure: $BX = XC$

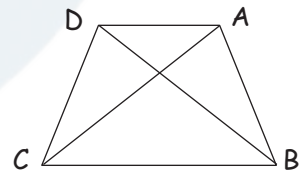
The area of $\triangle AXC = \dots$ the area of parallelogram ABCD

- a** $\frac{1}{2}$ **b** $\frac{1}{4}$ **c** $\frac{1}{8}$ **d** 2



5. If the area of $\triangle ABC =$ the area of $\triangle DBC$, then .

- a** $\overline{AB} \parallel \overline{CD}$ **c** $\overline{AD} \parallel \overline{BC}$
b $AB = CD$ **d** $AD = BC$



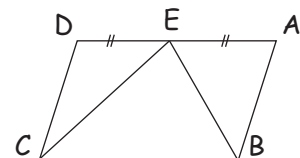
Q2) Answer the following questions :

1. In the opposite figure:

If ABCD is a parallelogram,

its area = 64 cm²

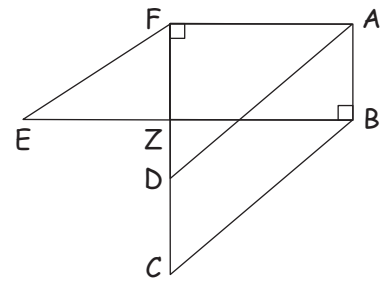
Find by proof: the area of $\triangle ABE$.



.....

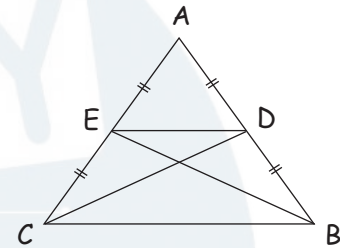
.....

2. In the opposite figure : $\overline{AB} \parallel \overline{CF}$, $\overline{AF} \parallel \overline{BE}$
 $ABCD$, $AMEF$ are two parallelograms
 Prove that :



The area of $\square ABCD$ = the area of $\square AMEF$

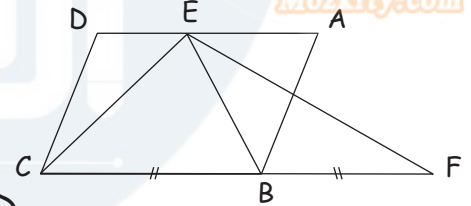
3. In the opposite figure :
 ABC is a triangle , D midpoint of \overline{AB} and
 E midpoint of \overline{AC}



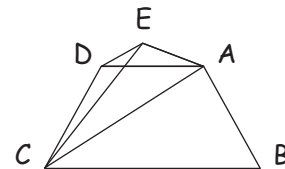
Prove that:

The area of $\triangle ADE = \frac{1}{4}$ the area of $\triangle ABC$

4. In the opposite figure:
 $ABCD$ is a parallelogram,
 B is the midpoint of \overline{CF} Prove that: The
 area of $\triangle EFB = \frac{1}{2}$ the area of $\square ABCD$



5. The area of figure $ABCD$ = the area of
 figure $ABCE$
 Prove that : $\overline{ED} \parallel \overline{AC}$



Model Answers Algebra

Model 1

1. **1. a** **2. c** **3. c** **4. d** **5. c**

2. **1. a.** $(x - 5)(x + 2)$ **b.** $(2x + 1)(x + 1)$
2. a. $(x - 6)^2$ **b.** $(x - 2)(x + 2)$
3. a. $(x + 2)(x^2 + 2x + 4)$
b. $(ax + bx) + (ay + by) = x(a + b) + y(a + b)$
 $= (a + b)(x + y)$
4. $(x + y)(x - y) = 7 \times 2 = 14$
5. $(7.8 + 2.2)^2 = (10)^2 = 100$

Model 2

1. **1. d** **2. c** **3. a** **4. c** **5. b**

2. **1. a.** $(x + 4)(x - 3)$ **b.** $(2x + 5)(x - 1)$
2. a. $(x - 4)^2$ **b.** $(2x - 3)(2x + 3)$
3. a. $(x - 4)(x^2 + 4x + 16)$
b. $(xy + 5y) + (7x + 35) = y(x + 5) + 7(x + 5)$
 $= (x + 5)(y + 7)$
4. $2.4 \div 8 = 3$
5. $(7.2 - 2.2)^2 = (5)^2 = 25$

Model 3

1. **1. c** **2. a** **3. c** **4. c** **5. a**

2. **1. a.** $(x - 2)(x + 3)$ **b.** $(2x - 3)(x + 3)$
2. a. $(x - 9)^2$ **b.** $(x - 4)(x + 4)$
3. a. $(x + 2)(x^2 - 4x + 4)$
b. $(xy + 3y) + (-7x - 35) = y(x + 5) - 7(x + 5)$
 $= (x + 5)(y - 7)$
4. $4 \times 8 = 32$
5. $(5.4 + 1.6)^2 = (7)^2 = 49$

Model 4

1. **1. c** **2. a** **3. c** **4. c** **5. b**

2. **1. a.** $(x - 4)(x - 9)$ **b.** $(3x - 2)(x + 5)$
2. a. $(3x - 4)^2$
b. $2(x^2 - 25) = 2(x - 5)(x + 5)$
3. a. $(x + 5)(x^2 - 5x + 25)$
b. $(5n - 10m) + (-an + 2am)$
 $= 5(n - 2m) - a(n - 2m)$
 $= (n - 2m)(5 - a)$
4. $\pm 5 \times 7 = \pm 35$
5. $(1.9 + 0.1)^2 = (2)^2 = 4$

Model 5

1. **1. c** **2. d** **3. d** **4. b** **5. b**

2. **1. a.** $(x - 10)(x + 1)$ **b.** $(2x - 5)(x + 4)$
2. a. $(5x - 4)^2$
b. $3(x^2 - 16) = 3(x - 4)(x + 4)$
3. a. $(x + 2)(x^2 - 2x + 26)$
b. $(3ax - a) + (-6bx + 2b)$
 $= a(3x - 1) - 2b(3x - 1)$
 $= (3x - 1)(a - 2b)$
4. Is $(4x - 3)$
5. $(9.1 - 0.1)^2 = (9)^2 = 81$

Model Answers Algebra

Model 1

1. **b** 2. **c** 3. **b** 4. **b** 5. **d**

2. 1. Area of $\square ABCD = 50 \times 30 = 1500 \text{ cm}^2$
 $= BC \times AE$

$$BC = \frac{1500}{24} = 62.5 \text{ cm}$$

2. a. area of $\triangle ABC = \frac{1}{2} \times 10 \times 8 = 40 \text{ cm}^2$

b. $40 = \frac{1}{2} \times 16 \times BE$

$$BE = 5 \text{ cm}$$

3. $\therefore \overline{AB} \parallel \overline{CF}$

$$\therefore a(\square ABCD) = a(\square ABZF) \rightarrow \textcircled{1}$$

$$\therefore \overline{AF} \parallel \overline{BE}$$

$$\therefore a(\square AMEF) = a(\square ABZF) \rightarrow \textcircled{2}$$

$$\therefore a(\square ABCD) = a(\square AMEF)$$

4. $\therefore E \in \overline{AD}$

$$\therefore a(\triangle EBC) = \frac{1}{2} a(\square ABCD) \rightarrow \textcircled{1}$$

$\therefore \overline{BE}$ is median of $\triangle EFC$

$$\therefore a(\triangle EBC) = \frac{1}{2} a(\triangle EFC) \rightarrow \textcircled{2}$$

$$\therefore a(\square ABCD) = a(\triangle EFC)$$

5. area of $\triangle AEC = \frac{1}{2} AE \times CB$
 $= \frac{1}{2} \times 2 \times 5 = 5 \text{ cm}^2$

$$\therefore \overline{ED} \parallel \overline{AC}$$

$$\therefore \text{area of } \triangle AEC = \text{area of } \triangle AMC = 5 \text{ cm}^2$$

with common base \overline{AC}

Model 2

1. **c** 2. **b** 3. **b** 4. **b** 5. **c**

2. 1. a) area of $\triangle ABC = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}$

b) $BC = \sqrt[3]{32 + 42} = 5 \text{ cm}$

$$\therefore \frac{1}{2} \times 5 \times AD = 6 \quad AD = \frac{12}{5} = 2.4 \text{ cm}$$

2. $\therefore \overline{AE} \parallel \overline{DC}$

$$\therefore a(\square ABCD) = a(\square BECD) \rightarrow \textcircled{1}$$

$$\therefore a(\triangle ABC) = \frac{1}{2} a(\square ABCD) \rightarrow \textcircled{2}$$

$$\therefore M \in \overline{BD}$$

$$\therefore a(\triangle CME) = \frac{1}{2} a(\square BECD) \rightarrow \textcircled{3}$$

$$\therefore a(\triangle ABC) = \frac{1}{2} a(\triangle MEC)$$

3. a) $\therefore \overline{AY} \parallel \overline{DE}$

$$\therefore a(\square ADEB) = a(\square XDEY)$$

With common base \overline{ED}

b) \therefore area of $\square ABED = 12 \times 24 = 288 \text{ cm}^2$

draw $\overline{BE} \perp \overline{AD}$

$$\therefore AD \times BE = 288$$

$$\therefore BE = \frac{288}{30} = 9.6 \text{ cm}$$

4. $a(\triangle ABE) = a(\triangle ACD)$ by subtract area of $\triangle ADE$

$$\therefore a(\triangle BDE) = a(\triangle DCE) \text{ with the common base } \overline{ED}$$

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

5. $\therefore \overline{AD} \parallel \overline{BC}$

$$a(\triangle ABM) = a(\triangle CDM)$$

$$\therefore a(\triangle MCE) = a(\triangle CMD) \text{ with base } \overline{CM}$$

$$\therefore \overline{MC} \parallel \overline{DE} \quad \overline{AC} \parallel \overline{DE}$$

Model 3

1. **a** 2. **c** 3. **b** 4. **c** 5. **c**

2. 1. $\therefore E \in \overline{AD}$

$$a(\triangle EBC) = \frac{1}{2} a(\square ABCD)$$

$$\therefore \overline{AB} \parallel \overline{CN}$$

$$\therefore a(\square ABCD) = a(\square ABMN)$$

with base \overline{AB}

$$\therefore a(\triangle EBC) = \frac{1}{2} a(\square ABMN)$$

2. $\therefore \overline{AD} \parallel \overline{BC}$

$$a(\triangle ABC) = a(\triangle DBC)$$

by subtract $a(\triangle AMD)$

$$a(\triangle AMB) = a(\triangle DMC) \rightarrow \textcircled{1}$$

$\therefore \overline{ME}$ is medim

$$a(\triangle BME) = a(\triangle CME) \rightarrow \textcircled{2}$$

By adding $\textcircled{1}$, $\textcircled{2}$

$$\therefore a(\text{figure ABEM}) = a(\text{figure DCEM})$$

3. $\therefore \overline{AD} \parallel \overline{BC}$

$$\therefore a(\triangle ABM) = a(\triangle CDM) \rightarrow \textcircled{1}$$

$\therefore \overline{ME}$ is medim of $\triangle EMC$

$$\therefore a(\triangle EMD) = a(\triangle DMC) \rightarrow \textcircled{2}$$

from $\textcircled{1}$, $\textcircled{2}$

$$\therefore a(\triangle EMD) = a(\triangle AMB)$$

4. $\therefore E \in \overline{AD}$

$$\therefore a(\triangle EBC) = \frac{1}{2} a(\square ABCD) = 26 \text{ cm}^2$$

$$\therefore a(\triangle ABE) = a(\triangle DEC) = 26 \text{ cm}^2$$

$$\therefore AE = DE$$

$$\therefore a(\triangle ABE) + a(\triangle DEC) = 13 \text{ cm}^2$$

5. $a(\triangle BED) = \frac{1}{2} \times 8 \times 5 = 20 \text{ cm}^2$

$$\therefore \overline{ED} \parallel \overline{BF}$$

$$\therefore a(\triangle FDE) + a(\triangle BDE) = 20 \text{ cm}^2$$

with common base \overline{DE}

Model 4

1. 1. c 2. c 3. d 4. c 5. d

2. 1. $a(\square ABCD) = 12 \times 5 = 60 \text{ cm}$

$$\therefore AB \times DE = 60$$

$$AB = \frac{60}{7.5} = 8 \text{ cm}$$

2. a. $AB = \sqrt{10^2 - 8^2} = 6 \text{ cm}$

$$a(\triangle ABC) = \frac{1}{2} \times 8 \times 6 = 24 \text{ cm}^2$$

$$a(\triangle ADC) = \frac{1}{2} \times 2 \times 8 = 8 \text{ cm}^2$$

$$\therefore a(\triangle ADC) = \frac{1}{3} a(\triangle ABC)$$

\rightarrow consider other solution

b) $DE = \frac{8}{5} = 1.6 \text{ cm}$

3. $a(\triangle ABE) = a(\triangle ACD)$ by subtract area of $\triangle ADE$

$$\therefore a(\triangle BDE) = a(\triangle DCE) \text{ with the common base } \overline{ED}$$

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

4. $\therefore \overline{AC} \parallel \overline{XY}$

$$XF = YF$$

$$a(\triangle AXF) = a(\triangle EYF) \rightarrow \textcircled{1}$$

$\therefore \overline{BF}$ is medim od $\triangle BXY$

$$\therefore a(\triangle BXF) = a(\triangle BYF) \rightarrow \textcircled{2}$$

by adding $\textcircled{1}$, $\textcircled{2}$

the area of $\triangle ABF =$ the area of $\triangle BCF$

5. $a(\triangle ABC) = \frac{1}{2} a(\square ABCD)$

$$\therefore \overline{DC} \parallel \overline{AE}$$

$$a(\square ABCD) = a(\square BECD)$$

$$\therefore M \in \overline{BD}$$

$$a(\triangle MEC) = \frac{1}{2} a(\square BECD)$$

$$\therefore a(\triangle ABC) = a(\triangle MEC)$$

Model 5

1. 1. b 2. c 3. b 4. b 5. c

2. 1. $E \in AD$

$$a(\triangle EBC) = \frac{1}{2} \times 64 = 32 \text{ cm}^2$$

$$\therefore a(\triangle ABE) + a(\triangle BDE) = 32 \text{ cm}^2$$

$$\therefore AE = ED$$

$$\therefore a(\triangle ABE) = a(\triangle CDE) = \frac{1}{2} \times 32 = 16 \text{ cm}^2$$

2. $\therefore \overline{AB} \parallel \overline{CF}$

$$\therefore a(\square ABCD) = a(\square ABZF) \rightarrow \textcircled{1}$$

$$\therefore \overline{AF} \parallel \overline{BE}$$

$$\therefore a(\text{▭ AMEF}) = a(\text{▭ ABZF}) \rightarrow \textcircled{2}$$

$$\therefore a(\text{▭ ABCD}) = a(\text{▭ AMEF})$$

3. $\therefore \overline{BE}$ is median of ΔABC

$$\therefore a(\Delta ABE) = \frac{1}{2} a(\Delta ABC)$$

$\therefore \overline{ED}$ is median of ΔABE

$$\therefore a(\Delta AED) = \frac{1}{2} a(\Delta ABE)$$

$$= \frac{1}{2} \times \frac{1}{2} a(\Delta ABC)$$

4. $\therefore E \in \overline{AD}$

$$\therefore a(\Delta EBC) = \frac{1}{2} a(\text{▭ ABCD})$$

$\therefore \overline{EB}$ is median of ΔEFC

$$\therefore a(\Delta EBC) = a(\Delta EFB) = \frac{1}{2} a(\text{▭ ABCD})$$

5. $\therefore a(\text{figure ABCD}) = a(\text{figure ABCE})$

by subtract area of ΔACB

$$\therefore a(\Delta ACD) = a(\Delta ACE)$$

with common base \overline{AC}

$$\therefore \overline{ED} \parallel \overline{AC}$$