This is a Class 1 exam

Lebanon Evangelical School for Boys and Girls

Lebanon Evangelical School
for Boys and Girls Loueizeh - Baabda

Stage Exam 03

16MAY2025

Do NOT write in this box. Your MARK will be placed here.

Subject :	Maths
Class :	8A, 8B, 8C and 8E
Teacher :	Mrs. Rima Al Banna
Duration :	1 hour

1. Write all of your solutions neatly on a separate paper unless stated otherwise.
2. Show all of your work.
3. Calculators are not allowed.

You are to answer the questions to this exam on : Squared paper

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

Exercise: 1 [10pts]

Given the expression $A(x) = (2x-1)^2 - (6x-3)(x-1) + (4x^2-1)$

1) Expand and reduce $A(x)$.
2) Factorize $A(x)$.
3) Calculate $A\left(\frac{3}{2}\right)$

Exercise: 2 [10pts]

Factorize each of the following expressions:

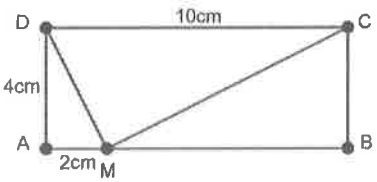
1) $(3x-1)(x+2) + (1-3x)(x-1) + 9x^2 - 6x + 1$
2) $ax^2 + yz - axy - xz$
3) $x^2 + 4x + 4 - 9y^2$

Exercise: 3 [6pts]

In the opposite figure ABCD is a rectangle, where AB = 10cm and BC = 4cm.

Let M be the point on the side [AB]such that AM = 2cm.

1) Calculate the exact lenghts of MD and MC.
2) Show that DMC is a right angled triangle.

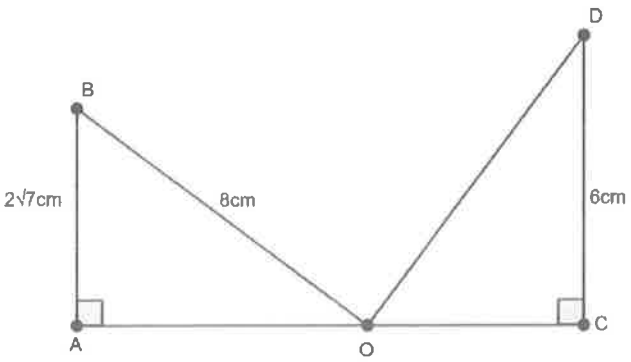


Exercise: 4 [8pts]

In the opposite figure, given:

- ABO and CDO two right angled triangles at A and C respectively;
- The points A, O and C are collinear;
- $AB = 2\sqrt{7}cm;\ CD = 6cm; OB = 8cm$

1) Calculate the length of the side [AO].
2) If the area of the triangle COD is equal to $6\sqrt{7}cm^2$, calculate OC and OD.
3) Deduce that OAB and DCO are congruent triangles.



Solution of SE03 Class 1

Maths - 8ABCE

Exercise 1

1) $A(x) = (2x-1)^2 - (6x-3)(x-1) + (4x^2-1)$

$A(x) = 4x^2 - 4x + 1 - [6x^2 - 6x - 3x + 3] + 4x^2 - 1$

$A(x) = 4x^2 - 4x + 1 - 6x^2 + 6x + 3x - 3 + 4x^2 - 1$

$A(x) = 2x^2 + 5x - 3$ (4)

2) $A(x) = (2x-1)^2 - (6x-3)(x-1) + (4x^2-1)$

$A(x) = (2x-1)^2 - 3(2x-1)(x-1) + (2x+1)(2x-1)$

$A(x) = (2x-1)[(2x-1) - 3(x-1) + (2x+1)]$

$A(x) = (2x-1)(2x-1-3x+3+2x+1)$

$A(x) = (2x-1)(x+3)$ (4)

3) $A(x) = (2x-1)(x+3)$

$A\left(\frac{3}{2}\right) = \left[2\left(\frac{3}{2}\right) - 1\right]\left[\frac{3}{2} + 3\right]$

$A\left(\frac{3}{2}\right) = (3-1)\left(\frac{3+6}{2}\right)$ (2)

$A\left(\frac{3}{2}\right) = (2)\left(\frac{9}{2}\right) = 9$

(each ✓ is a ¼)

Exercise 2

1) $(3x-1)(x+2) + (1-3x)(x-1) + 9x^2 - 6x + 1$

$= (3x-1)(x+2) - (3x-1)(x-1) + (3x-1)^2$

$= (3x-1)[(x+2) - (x-1) + (3x-1)]$

$= (3x-1)(x+2-x+1+3x-1)$ (3½)

$= (3x-1)(3x+2)$

2) $ax^2 + yz - axy - xz$
$= ax^2 - axy + yz - xz$
$= ax(x-y) + z(y-x)$ ③
$= ax(x-y) - z(x-y)$
$= (x-y)(ax-z)$.

3) $x^2 + 4x + 4 - 9y^2$
$= (x+2)^2 - 9y^2$
$= [(x+2) + 3y][(x+2) - 3y]$
$= (x+2+3y)(x+2-3y)$.

(each ✓ is a ¼)

Exercise 3

1) ΔAMD is right angled at A ($B\hat{A}D = 90°$ property of rectangle ABCD).
$MD^2 = AD^2 + AM^2$ (according to Pythagorean Theorem)
$MD^2 = 4^2 + 2^2 = 16 + 4 = 20$
so $MD = \sqrt{20} = 2\sqrt{5}$ cm. ②

$MB = BC - AM = 10 - 2 = 8$ cm.
ΔBCM is right angled at B ($A\hat{B}C = 90°$ property of rectangle ABCD)
$MC^2 = MB^2 + BC^2$ (according to Pythagorean Theorem).
$MC^2 = 8^2 + 4^2 = 64 + 16 = 80$
so $MC = \sqrt{80} = 4\sqrt{5}$ cm. ②

2) In ΔDMC we have:
$DC^2 = 10^2 = 100$.
$MD^2 + MC^2 = 20 + 80 = 100$.
since $DC^2 = MD^2 + MC^2 = 100$ then, ΔDMC is right angled at M by the converse of Pythagorean Theorem.

(each ✓ is a ¼)

Exercise : 4.

1) ΔABO is right angled at A, then:

$BO^2 = AO^2 + AB^2$ (according to Pythagorean Theorem).

$8^2 = AO^2 + (2\sqrt{7})^2$

$64 = AO^2 + 28$

$AO^2 = 64 - 28 = 36$ so $AO = \sqrt{36} = 6$ cm

2) Area of $\Delta COD = \frac{\text{height} \times \text{base}}{2}$

$6\sqrt{7} = \frac{OC \times CD}{2}$

$6\sqrt{7} = \frac{OC \times 6}{2}$

$6\sqrt{7} = 3OC$ so $OC = \frac{6\sqrt{7}}{3} = 2\sqrt{7}$ cm

ΔCOD is right angled at C, then:

$OD^2 = OC^2 + CD^2$ (according to Pythagorean Theorem)

$OD^2 = (2\sqrt{7})^2 + 6^2$

$OD^2 = 28 + 36 = 64$ so $OD = \sqrt{64} = 8$ cm.

3) In the 2 right angled Δ OAB and DOC we have:

$OD = OB = 8$ cm (proven) ... H

$OC = AB = 2\sqrt{7}$ cm (proven) ... L

$\therefore$ The 2 right angled Δ are congruent by HL.

(each ✓ is a 1/4)