This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

Stage Exam 03
10FEB2026

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. Show all of your work.
2. Calculators are not allowed.

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 [7pts]

Consider the three numbers:

$$A = \sqrt{\frac{\frac{1}{2}+\frac{3}{4}}{\frac{1}{16}+\frac{1}{4}}} \qquad B = \frac{\frac{1}{4}+\frac{1}{2}\times\frac{3}{2}}{\frac{1}{2}-\frac{1}{6}} \qquad \text{and} \quad C = \frac{\left(\frac{1}{3}\right)^2+\frac{1}{3}\times\frac{5}{9}}{\left(\frac{4}{3}\right)^2-\frac{2}{3}\times\frac{4}{3}}$$

1) Show that A is a natural number.
2) Show that A and B are two consecutive integers.
3) Show that C is the reciprocal of B.

Exercise: 2 [3pts]

Given the following expressions:

$$E = \frac{4\,a^2c^2}{5b^4} \div \frac{2a^2c^3}{-b^5} \qquad \text{and} \qquad F = \frac{12a^2b^2c}{3a\,b^3} \div \frac{10\,a\,c^2}{b^2}$$

1) Calculate and simplify E and F.
2) Verify that E and F are opposite numbers.

Exercise: 3 [3pts]

Calculate and simplify where possible:

1) $\frac{-3a+2}{6} - \frac{1-4a}{12} + \frac{a-2}{4}$

2) $\left(\frac{a-1}{4}+\frac{a}{2}\right) \div \frac{3a-1}{4a}$

Exercise: 4 [4pts]

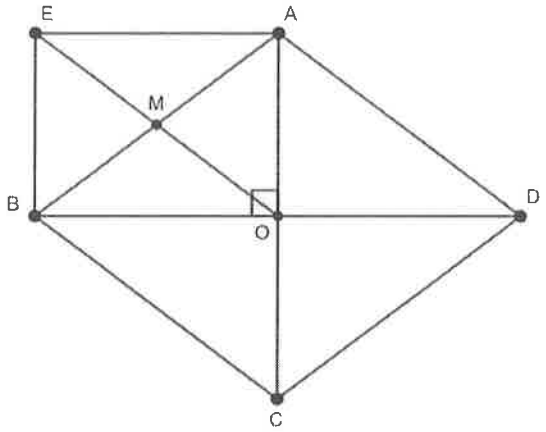
Consider the expression: $E(x) = (3x-1)^2 - (2x-2)(3x-1)$

1) Expand and reduce $E(x)$.
2) Calculate $E(\sqrt{3})$

Exercise: 5 [8pts]

ABCD is a rhombus of center O and M is the midpoint of [AB]. E is the symmetric of O with respect to M.

1) Show that triangle OMB is an isosceles triangle.
2) Prove that quadrilateral AEBO is a rectangle.
3) Prove that quadrilateral OEBC is a parallelogram.



Solution of SE03 Maths 8 ABCE

Class 1

Exercise : 1

1) $A = \sqrt{\dfrac{\frac{1}{2}\times 2 + \frac{3}{4}}{\frac{1}{16} + \frac{1}{4\times 4}}} = \sqrt{\dfrac{\frac{2+3}{4}}{\frac{1+4}{16}}} = \sqrt{\dfrac{\frac{5}{4}}{\frac{5}{16}}} = \sqrt{\dfrac{5}{4} \times \dfrac{16}{5}}$

$= \sqrt{4} = 2$ ②

2) $B = \dfrac{\frac{1}{4} + \frac{1}{2}\times\frac{3}{2}}{\frac{1\times 3}{2\times 3} - \frac{1}{6}} = \dfrac{\frac{1}{4} + \frac{3}{4}}{\frac{3-1}{6}} = \dfrac{\frac{4}{4}}{\frac{2}{6}} = 1 \times \dfrac{6}{2} = 3$ ②

$A + 1 = 2 + 1 = 3 = B$ verified. (1/4)

3) $C = \dfrac{\left(\frac{1}{3}\right)^2 + \frac{1}{3}\times\frac{5}{9}}{\left(\frac{4}{3}\right)^2 - \frac{2}{3}\times\frac{4}{3}} = \dfrac{\frac{1\times 3}{9\times 3} + \frac{5}{27}}{\frac{16}{9} - \frac{8}{9}} = \dfrac{\frac{8}{27}}{\frac{8}{9}} = \dfrac{8}{27} \times \dfrac{9}{8} = \dfrac{1}{3}$ ②

$B \times C = 3 \times \dfrac{1}{3} = 1$ then, C is the reciprocal of B since their product is 1. (3/4)

Exercise : 2

$E = \dfrac{4a^2c^2}{5b^4} \div \dfrac{2a^2c^3}{-b^5} = \dfrac{4a^2c^2}{5b^4} \times \dfrac{-b^5}{2a^2c^3} = \dfrac{-4a^2c^2b^5}{10a^2c^3b^4}$

$= \dfrac{-2b}{5c}$ ①

$F = \dfrac{12a^2b^2c}{3ab^3} \div \dfrac{10ac^2}{b^2} = \dfrac{12a^2b^2c}{3ab^3} \times \dfrac{b^2}{10ac^2} = \dfrac{12a^2b^2c}{3(10)a^2b^3c^2} = \dfrac{2b}{5c}$ ①

2) $E + F = \frac{-2b}{5c} + \frac{2b}{5c} = \frac{-2b+2b}{5c} = \frac{0}{5c} = 0$ ①

then, E and F are opposite numbers since their sum is 0.

Exercise : 3

1) $\frac{(-3a+2)\times 2}{6\times 2} - \frac{1-4a}{12} + \frac{(a-2)\times 3}{4\times 3} = \frac{-6a+4-1+4a+3a-6}{12}$

$= \frac{a-3}{12}$ ②

2) $\left(\frac{a-1}{4} + \frac{a\times 2}{2\times 2}\right) \div \frac{3a-1}{4a} = \frac{a-1+2a}{4} \div \frac{3a-1}{4a}$

$= \frac{3a-1}{4} \times \frac{4a}{3a-1} = a$ ①

Exercise : 4

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

$E(x) = 9x^2 - 6x + 1 - (6x^2 - 2x - 6x + 2)$

$E(x) = 9x^2 - 6x + 1 - 6x^2 + 2x + 6x - 2$

$E(x) = 3x^2 + 2x - 1$ ③

$E(\sqrt{3}) = 3(\sqrt{3})^2 + 2\sqrt{3} - 1$

$= 3 \times 3 + 2\sqrt{3} - 1$

$= 9 + 2\sqrt{3} - 1$

$= 8 + 2\sqrt{3}$ ①

Exercise: 5

1) ΔAOB is right angled at O $\Rightarrow$ [AB] is the hypotenuse.
[OM] is the median relative to [AB] (M is the midpt. of [AB])
$\Rightarrow OM = \frac{AB}{2}$ (Property of a median relative to the hypotenuse in a right angled Δ).

In ΔOMB we have:

$OM = \frac{AB}{2}$ (proven) (2)

$BM = \frac{AB}{2}$ (M is the midpt. of [AB]). $\Rightarrow OM = BM$ by comparison

then ΔOMB is an isosceles Δ of main vertex M for having 2 equal sides.

2) In quadrilateral AEBO we have:
M is the midpt. of [AB] (given)
M is the midpt. of [OE] (by symmetry) (3)
and [AB] and [OE] are the diagonals of AEBO
then, AEBO is a parallelogram for having its diagonals bisect each other.
but, $A\hat{O}B = 90°$ (property of rhombus ABCD)
$\therefore$ AEBO is a rectangle for being a parallelogram having one right $\angle$.

3) In quadrilateral OEBC we have:
$BE = OA$ (property of rectangle AEBO) $\Rightarrow BE = OC = OA$ by comparison.
$OC = OA$ (O is the midpt. of [AC])
(BE) // (OA) (property of rectangle AEBO) and since C belongs to (OA) $\Rightarrow$ (BE) // (OC)
$\therefore$ OEBC is a parallelogram for having one pair of opposite sides // and equal. (3)