This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

SE01 Exam

10NOV2025

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

Subject :	Maths
Class :	10A
Teacher :	Mrs.Claudine Eid
Duration :	1 hour

Calculators are allowed

You are to answer the questions to this exam on : This exam 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.

Answer ALL questions.

Write your answers in the space provided

You must write down all the stages in your working.

1. Use algebra to solve the simultaneous equations

$$4x - 5y = 20$$

$$6x + 7y = -57$$

You must show all your working.

$x =$ .....

$y =$ .....

(Total for Question 1 is 4 marks)

1. Show that $\frac{6x-y}{10xy}+\frac{1}{2x}-\frac{2y-7x}{5xy}$ simplifies to $\frac{k}{y}$ where k is an integer.

(Total for Question 2 is 3 marks)

2. Simplify fully

$$\frac{1-9x^2}{3x^2-13x+4}$$

.....

(3)

(Total for Question 3 is 3 marks)

4. Make p the subject of the formula $t = \dfrac{2(2p-3)}{5-2p}$

.....

(Total for Question 4 is 4 marks)

5. Express $3x^2 + 18x - 1$ *in the form* $a(x+b)^2 + c$

.....

(3)

(Total for Question 5 is 3 marks)

6. Solve the simultaneous equations

$$y^2 = 3x^2 + 4$$

$$y + 2x = 7$$

Give your solutions correct to 3 significant figures.

.....

(Total for Question 6 is 4 marks)

7.(*a*) Simplify fully $\frac{(a-3)^2}{5(a-3)}$

.....

(1)

(*b*) Factorise $3k^2 + 11k - 4$

.....

(2)

(*c*) Simplify fully $\frac{4-x^2}{x^2+3x} \div \frac{x+2}{x+3}$

.....

(3)

(Total for Question 7 is 6 marks)

8. Prove that the difference in the squares of two consecutive even numbers is always a multiple of 4

(Total for Question 8 is 3 marks)

9. Solve the quadratic equation $15 = 2x^2 - 7x$

.....

(3)

(Total for Question 9 is 3 marks)

10. (a) Rationalise the denominator of $\frac{35}{\sqrt{7}}$

Give your answer in its simplest form.

.....

(2)

$\frac{\sqrt{27}-1}{2-\sqrt{3}}$ can be written in the form $a + b\sqrt{3}$ where a and b are integers.

(b) Work out the value of a and the value of b.

$a =$ .....

$b =$ .....

(4)

(Total for Question 10 is 6 marks)

11. Solve the equation $3x^2 - 2x - 2 = 0$.
Give your answer correct to 3 significant figures .

.....

(3)

(Total for Question 11 is 3 marks)

12. Show that $2 + \left[(x + 6) \div \frac{x^2+7x+6}{x-2}\right]$ simplifies to $\frac{ax}{cx+d}$ where a, c, d are integers.

.....

(4)

(Total for Question 12 is 4 marks)

TOTAL FOR PAPER IS 46 MARKS

Answer ALL questions.

Write your answers in the space provided

You must write down all the stages in your working.

1.

Use algebra to solve the simultaneous equations

$$4x - 5y = 20$$

$$6x + 7y = -57$$

You must show all your working.

$7(4x - 5y = 20)$

$5(6x + 7y = -57)$

$28x - 35y = 140$ [1]

$30x + 35y = -285$ [1]

$58x = -145$

$x = \frac{-5}{2}$ [1]

$4x - 5y = 20$

$4\left(\frac{-5}{2}\right) - 5y = 20$

$-5y = 30$ [1]

$y = -6$

$x =$ -2.5

$y =$ -6

(Total for Question 1 is 4 marks)

2. Show that $\frac{6x-y}{10xy}+\frac{1}{2x}-\frac{2y-7x}{5xy}$ simplifies to $\frac{k}{y}$ where k is an integer.

$= \frac{6x-y}{10xy} + \frac{1(5y)}{2x(5y)} - \frac{2(2y-7x)}{2(5xy)}$ LCM $= 10xy$

[1] [1]

$= \frac{6x-y+5y-4y+14x}{10xy}$

$= \frac{20x}{10xy}$

$= \frac{2}{y}$ [1]

(Total for Question 2 is 3 marks)

3. Simplify fully $\frac{1-9x^2}{3x^2-13x+4}$

$= \frac{-1(1-3x)(1+3x)}{(3x-1)(x-4)} = \frac{-1(1+3x)}{(x-4)}$

[1] [1] [1]

.....

(3)

(Total for Question 3 is 3 marks)

4. Make p the subject of the formula $t = \frac{2(2p-3)}{5-2p}$

$4p - 6 = 5t - 2pt$ [1]

$4p + 2pt = 5t + 6$ [1]

$p(4 + 2t) = 5t + 6$ [1]

$p = \frac{5t+6}{4+2t}$ [1]

$p = \frac{5t+6}{4+2t}$

(Total for Question 4 is 4 marks)

5. Express $3x^2 + 18x - 1$ *in the form* $a(x + b)^2 + c$

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

$3((x+3)^2 - 9) - 1$ [1]

$3(x+3)^2 - 27 - 1$

$3(x+3)^2 - 28$ [1]

(3)

(Total for Question 5 is 3 marks)

6. Solve the simultaneous equations

$$y^2 = 3x^2 + 4$$

$$y + 2x = 7$$

Give your solutions correct to 3 significant figures.

$y = 7 - 2x$

$(7-2x)^2 = 3x^2 + 4 \Rightarrow (7-2x)(7-2x) = 3x^2 + 4$

$\Rightarrow 49 + 4x^2 - 28x = 3x^2 + 4 \Rightarrow x^2 - 28x + 45 = 0$

$x_1 = \dfrac{28 - \sqrt{(-28)^2 - 4(45)}}{2} = 1{,}71$ [1]

$x_2 = \dfrac{28 + \sqrt{(-28)^2 - 4(45)}}{2} = 26{,}3$ [1]

$y_1 = 7 - 2(1{,}71) = 3{,}58$ [1]

$y_2 = 7 - 2(26{,}3) = -45{,}6$ [1]

$(1{,}71, 3{,}58) \quad (26{,}3, -45{,}6)$

.....

(Total for Question 6 is 4 marks)

7.(*a*) Simplify fully $\frac{(a-3)^2}{5(a-3)}$

$= \frac{(a-3)}{5}$ [1]

$\frac{a-3}{5}$

(1)

(*b*) Factorise $3k^2 + 11k - 4$

$(3k-1)(k+4)$ [1] [1]

$(3k-1)(k+4)$

(2)

(*c*) Simplify fully $\frac{4-x^2}{x^2+3x} \div \frac{x+2}{x+3}$

$\frac{(2-x)(2+x)}{x(x+3)} \cdot \frac{(x+3)}{(x+2)} = \frac{2-x}{x}$ [1] [1] [1]

$\frac{2-x}{x}$

(3)

(Total for Question 7 is 6 marks)

8. Prove that the difference in the squares of two consecutive even numbers is always a multiple of 4

$(2n+2)^2 - (2n)^2$ [1]

$4n^2 + 8n + 4 - 4n^2$ [1]

$8n + 4$

$4(2n+1)$ is a multiple of 4 [1]

(Total for Question 8 is 3 marks)

9. Solve the quadratic equation $15 = 2x^2 - 7x$

$2x^2 - 7x - 15 = 0$

$(x-5)(2x+3) = 0$ [1]

$x - 5 = 0$ or $2x + 3 = 0$

$x = 5$ [1]

$2x = -3$

$x = -\frac{3}{2}$ [1]

.....

(3)

(Total for Question 9 is 3 marks)

10. (a) Rationalise the denominator of $\frac{35}{\sqrt{7}}$

Give your answer in its simplest form.

$$\frac{35\sqrt{7}}{\sqrt{7}\sqrt{7}} = \frac{35\sqrt{7}}{7} = 5\sqrt{7}$$

[1] [1]

$5\sqrt{7}$

(2)

$\frac{\sqrt{27}-1}{2-\sqrt{3}}$ can be written in the form $a + b\sqrt{3}$ where a and b are integers.

(b) Work out the value of a and the value of b.

$$\frac{(\sqrt{27}-1)(2+\sqrt{3})}{(2-\sqrt{3})(2+\sqrt{3})} = \frac{(3\sqrt{3}-1)(2+\sqrt{3})}{(2)^2-(\sqrt{3})^2}$$

[1] [1] [1]

$$= \frac{6\sqrt{3}-2+9-\sqrt{3}}{4-3} = \frac{5\sqrt{3}+7}{1}$$

[1]

$a =$ 7

$b =$ 5

(4)

(Total for Question 10 is 6 marks)

11. Solve the equation $3x^2 - 2x - 2 = 0$.
Give your answer correct to 3 significant figures .

$$x_1 = \frac{2 - \sqrt{(-2)^2 - 4(3)(-2)}}{6} = \frac{1 - \sqrt{7}}{3} \approx -0.549$$ [1]

$$x_2 = \frac{2 + \sqrt{28}}{6}$$ [1] $$= \frac{1 + \sqrt{7}}{3} \approx 1.22$$ [1]

$x_1 = -0.549$, $x_2 = 1.22$

(3)

(Total for Question 11 is 3 marks)

12. Show that $2 + \left[(x + 6) \div \frac{x^2 + 7x + 6}{x - 2}\right]$ simplifies to $\frac{ax}{cx + d}$ where a, c, d are integers.

$$2 + \left[(x+6) \cdot \frac{(x-2)}{x^2+7x+6}\right]$$ [1]

$$2 + \left[\frac{(x+6)(x-2)}{(x+6)(x+1)}\right]$$ [1]

$$\frac{2(x+1) + x - 2}{x+1}$$ [1]

$$\frac{2x+2+x-2}{x+1} = \frac{3x}{x+1}$$ [1]

$\frac{3x}{x+1}$

(4)

(Total for Question 12 is 4 marks)

TOTAL FOR PAPER IS 46 MARKS