This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

Stage Exam 03

26JAN2024

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

Subject :	A Level : Maths M0
Class :	11A and 12A
Teacher :	George Haber
Duration :	1 hour

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.

I. Solve the following quadratic equations using delta: **[8pts.]**

a) $25x^2 - 19 = 6x$

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b) $x^2 - 2x - 24 = 0$

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c) $m^2 = 20 - 4m$

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d) $x^2 + 3x + \frac{5}{6} = -2x^2 - 3x - \frac{1}{6}$

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II. Solve the following quadratic equation by factoring: **[2pts.]**

$$3x^2 - 5x = 12$$

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III. Solve the following simultaneous equations and plot (x,y) on the graph. **[15pts.]**

a) $\begin{cases} 5x + 3y = 13 \\ 4x - 2y = 6 \end{cases}$

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b) $\begin{cases} 3x + 2y = 13 \\ 4x + 4y = 20 \end{cases}$

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c) $\begin{cases} 4x + 7y = 1 \\ 3x + 10y = 15 \end{cases}$

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d) $\begin{cases} y = 4x \\ 3x + 2y = 11 \end{cases}$

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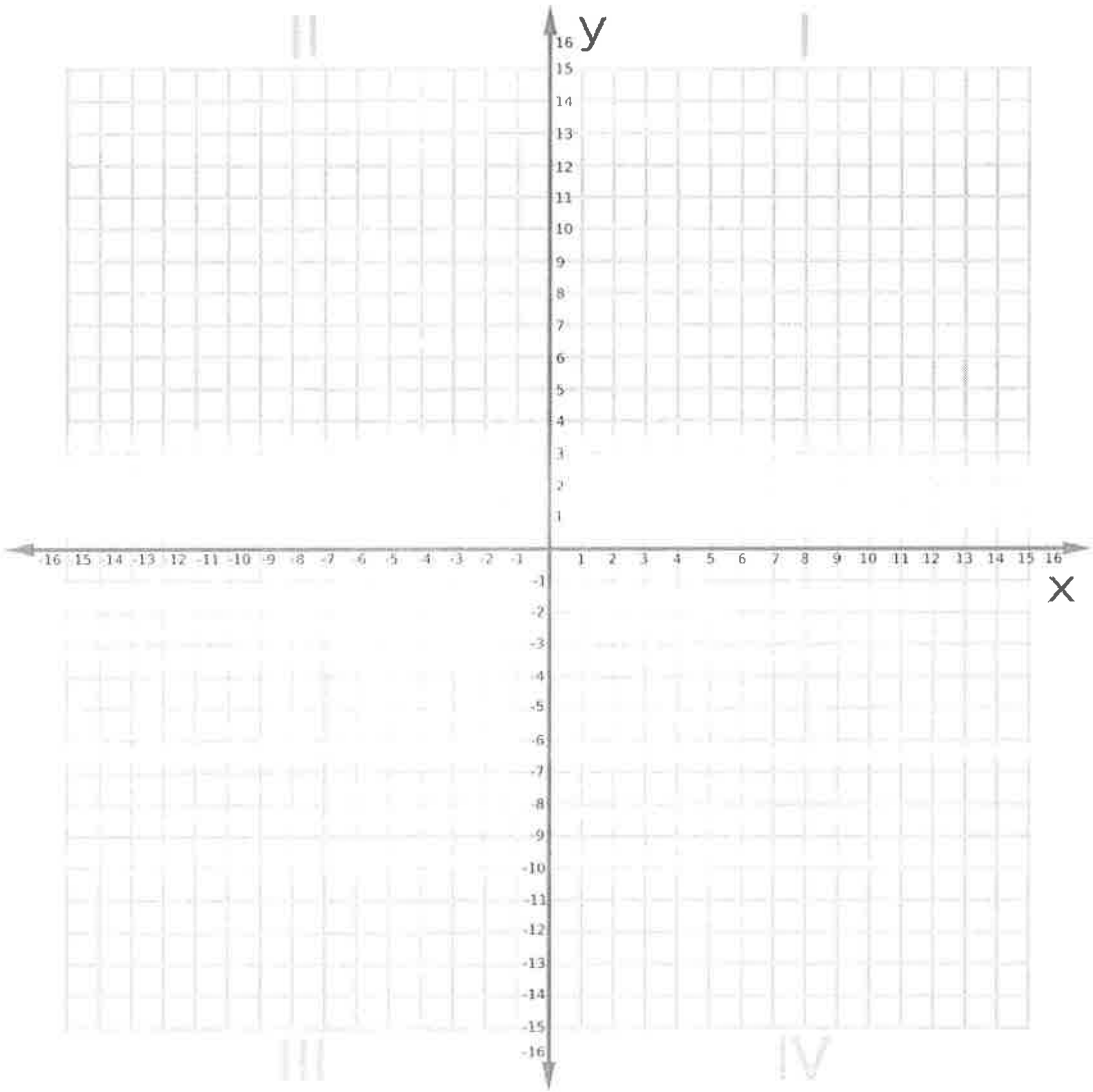
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e) $\begin{cases} y - 3x = 0 \\ 2x + 2y = 24 \end{cases}$

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[5pts.]



IV. In a cinema:
2 adults and 5 children tickets cost $26
4 adults and 2 children tickets cost $28
Let the cost of adult ticket = $A
Let the cost of children ticket = $B
Work out the cost of an adult and a child ticket. **[5pts.]**

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V. In a test with 20 questions, x marks are awarded for each correct answer and y marks are deducted for each incorrect answer. Benjamin answered 12 questions correctly and 8 questions incorrectly, and he scored 44 points. Emma answered 14 questions correctly and 6 questions incorrectly, and she scored 58 points. How many points were deducted for each incorrect answer? **[5pts.]**

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VI. C is the curve with equation $y = x^2 - 6x + 6$
L is the straight line with equation $y = 2x - 9$
L intersects C at two points, A and B.
Calculate the exact length of AB. **[5pts.]**

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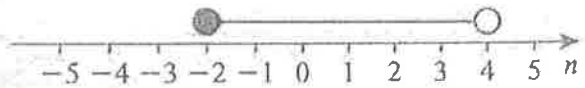
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VII. $-4 < n \leq 1$ where n is an integer.

a Write down all the possible values of n.

b Write down the inequality represented on the number line.



March 2013, Q4,

[5pts.]

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VIII. Petra booked a family holiday trip.
The total cost of this trip was \$3500 plus VAT at 20%.
Petra paid \$900 of the total cost when she booked her holiday.
She paid the rest of the total cost in 6 equal monthly payments.
Work out the amount of each monthly payment. **[5pts.]**

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IX. Mr. Peter asks 240 year 11 students what they want to do next year.
15% of the students want to go to college.
$\frac{3}{4}$ of the students want to stay at school.
The rest of the students do not know.
Work out the number of students who do not know. **[5pts.]**

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I. Solve the following quadratic equations using delta: **[8pts.]**

a) $25x^2 - 19 = 6x$ $\quad 25x^2 - 6x - 19 = 0$

$\Delta = b^2 - 4ac$

$= (-6)^2 - 4(25)(-19)$

$= 1936$

$x' = \frac{6 - \sqrt{1936}}{2(25)} = -\frac{19}{25}$

$x'' = \frac{-6 + \sqrt{1936}}{2(25)} = 1$

b) $x^2 - 2x - 24 = 0$

$\Delta = b^2 - 4ac$

$= (-2)^2 - 4(1)(-24)$

$= 100$

$x' = \frac{2 - \sqrt{100}}{2} = -4$

$x'' = \frac{2 + \sqrt{100}}{2} = 6$

c) $m^2 = 20 - 4m$ $\quad m^2 + 4m - 20 = 0$

$\Delta = b^2 - 4ac$

$= (4)^2 - 4(-20)$

$= 96$

$m' = \frac{-4 - \sqrt{96}}{2} = -2 - 2\sqrt{6}$

$m'' = \frac{-4 + \sqrt{96}}{2} = -2 + 2\sqrt{6}$

d) $x^2 + 3x + \frac{5}{6} = -2x^2 - 3x - \frac{1}{6}$ $\quad 3x^2 + 6x + 1$

$\Delta = b^2 - 4ac$

$= 6^2 - 4(3)$

$= 24$

$x' = \frac{-6 - \sqrt{24}}{2(3)} = -\frac{3 + \sqrt{6}}{3}$

$x'' = \frac{-6 + \sqrt{24}}{2(3)} = -\frac{3 + \sqrt{6}}{3}$

II. Solve the following quadratic equation by factoring: **[2pts.]**

$3x^2 - 5x = 12$ $3x^2-5x-12=0$

$3x^2-5x-12=0$

$(3x+4)(x-3)=0$

$3x+4=0$ $x-3=0$

$3x=-4$ $x=3$

$x=-\frac{4}{3}$

III. Solve the following simultaneous equations and plot (x,y) on the graph. **[15pts.]**

a) $\begin{cases} 5x+3y=13 \\ 4x-2y=6 \end{cases}$ (x2) (x3)

$\begin{cases} 10x+6y=24 \\ 12x-6y=18 \end{cases}$ $22x=44$ $4(2)-2y=6$

$x=\frac{44}{22}$ $8-2y=6$

$x=2$ $-2y=-2$

$y=1$

b) $\begin{cases} 3x+2y=13 \\ 4x+4y=20 \end{cases}$ (x-2)

$\begin{cases} -6x-4y=-26 \\ 4x+4y=20 \end{cases}$ $-2x=-6$ $3(3)+2y=13$

$x=\frac{-6}{-2}$ $9+2y=13$

$x=3$ $2y=13-9$

$2y=4$ $y=2$

c) $\begin{cases} 4x+7y=1 \\ 3x+10y=15 \end{cases}$ x(-3) (x4)

$\begin{cases} -12x-21y=-3 \\ 12x+40y=60 \end{cases}$ $19y=57$ $4x+7(3)=1$

$y=\frac{57}{19}$ $4x+21=1$

$y=3$ $4x=1-21$

$4x=-20$

$x=\frac{-20}{4}$ $x=-5$

d) $\begin{cases} y=4x \\ 3x+2y=11 \end{cases}$

$3x+2(4x)=11$ $y=4$

$3x+8x=11$

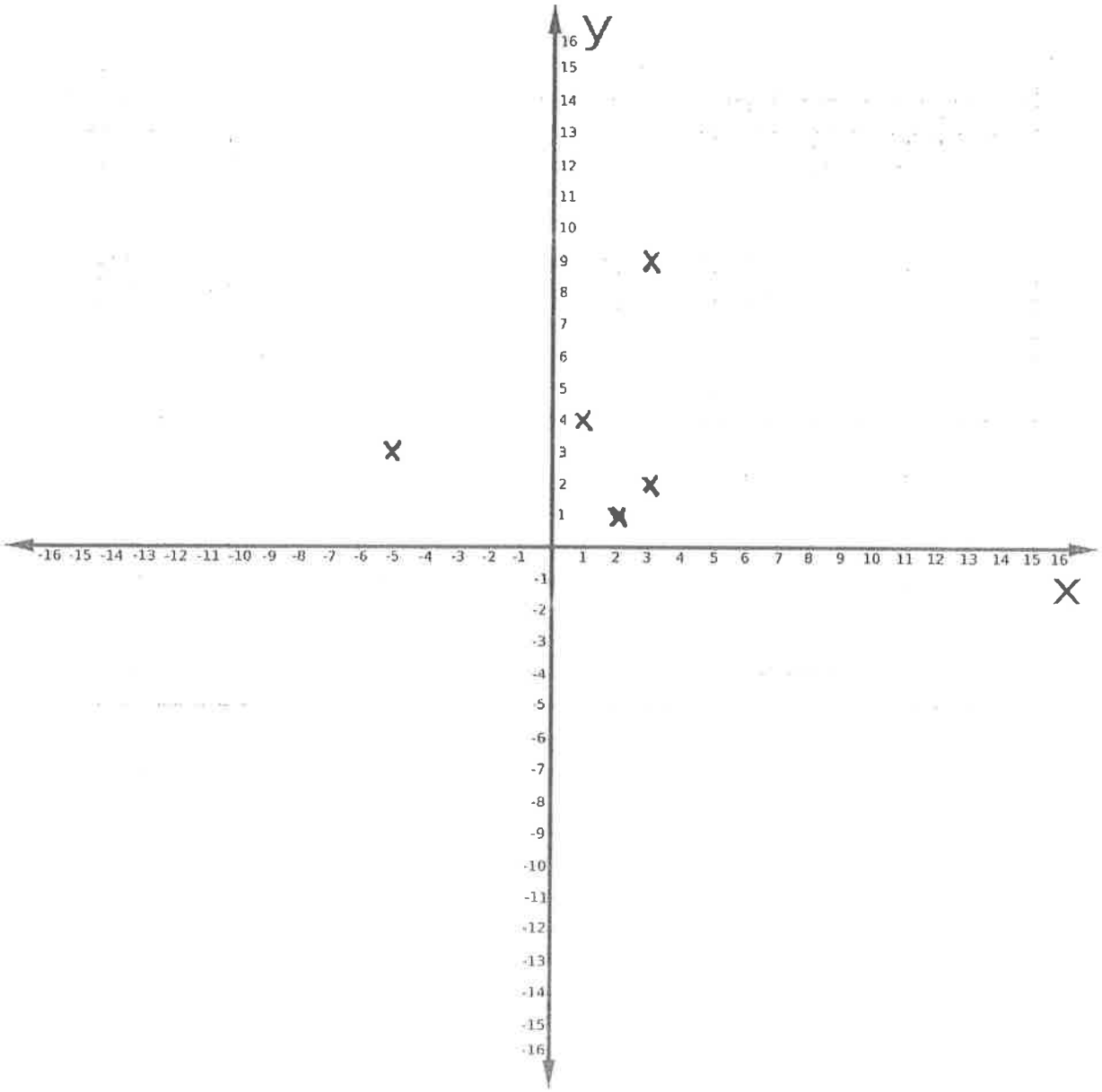
$11x=11$

$x=1$

e) $\begin{cases} y - 3x = 0 \\ 2x + 2y = 24 \end{cases}$ $x(-2)$

$\begin{cases} -2y + 6x = 0 \\ 2x + 2y = 24 \end{cases}$ $8x = 24$ $x = \frac{24}{8}$ $\boxed{x = 3}$ $y - 3(3) = 0$ $y - 9 = 0$ $\boxed{y = 9}$

[5pts.]



IV. In a cinema:
2 adults and 5 children tickets cost $26
4 adults and 2 children tickets cost $28
Let the cost of adult ticket = $A
Let the cost of children ticket = $B
Work out the cost of an adult and a child ticket. **[5pts.]**

$\times(-2)$ $\begin{cases} 2A+5B=26 \\ 4A+2B=28 \end{cases}$

$\begin{cases} -4A-10B=-52 \\ 4A+2B=28 \end{cases}$

$-8B=-24$

$B=\frac{24}{8}$ $\boxed{B=\$3}$

$2A+5(3)=26$

$2A+15=26$

$2A=26-15$

$\boxed{A=\frac{11}{2}\ \$1}$

V. In a test with 20 questions, x marks are awarded for each correct answer and y marks are deducted for each incorrect answer. Benjamin answered 12 questions correctly and 8 questions incorrectly, and he scored 44 points. Emma answered 14 questions correctly and 6 questions incorrectly, and she scored 58 points. How many points were deducted for each incorrect answer? **[5pts.]**

$(\times 6)$ $\begin{cases} 12x-8y=44 \\ (\times 8)\ 14x-6y=58 \end{cases}$

$\begin{cases} 72x-48y=264 \\ -112x+48y=-464 \end{cases}$

$-40x=-200$

$x=\frac{200}{40}$

$\boxed{x=5}$

$12(5)-8y=44$

$60-8y=44$

$-8y=44-60$

$-8y=-16$

$\boxed{y=2}$

2 points were deducted.

VI. C is the curve with equation $y = x^2 - 6x + 6$
L is the straight line with equation $y = 2x - 9$
L intersects C at two points, A and B.
Calculate the exact length of AB. **[5pts.]**

$x^2 - 6x + 6 = 2x - 9$ | $A(3; -3)$

$x^2 - 8x + 15 = 0$ | $B(5; 1)$

$x = 3$ or $x = 5$ | $AB = \sqrt{(5-3)^2 + (1+3)^2}$

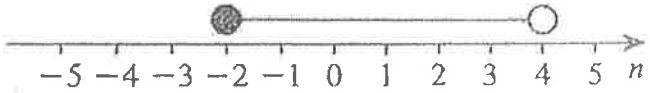
$y = -3$ $y = 1$ | $= \sqrt{4 + 16} = \sqrt{20} = 2\sqrt{5}$

$[AB] = 2\sqrt{5}$

VII. $-4 < n \leq 1$ where n is an integer.

a Write down all the possible values of n.

b Write down the inequality represented on the number line.



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[5pts.]

a) $-3; -2; -1; 0; 1$

b) $-2 \leq n \leq 4$

VIII. Petra booked a family holiday trip.
The total cost of this trip was \$3500 plus VAT at 20%.
Petra paid \$900 of the total cost when she booked her holiday.
She paid the rest of the total cost in 6 equal monthly payments.
Work out the amount of each monthly payment. **[5pts.]**

$3500 \times 20\% = 700$

The trip will cost 4200 \$ after the V.A.T.

$4200 - 900 = 3300$ \$

$3300 \div 6 = 550$ \$ 550 is the amount paid monthly.

IX. Mr. Peter asks 240 year 11 students what they want to do next year.
15% of the students want to go to college.
$\frac{3}{4}$ of the students want to stay at school.
The rest of the students do not know.
Work out the number of students who do not know. **[5pts.]**

1) 240 x 0.15 = 36

2) 240 x 3/4 = 180

240 - (36 + 180) = 240 - 216 = 24 Students