

Revision F5 (Topics 20-24) [46] MARKSCHEME

1.

- (a) 1.3 and -0.8 B1
B1

*Allow 1.25 to 1.30
and -0.75 to -0.8*

- (b) $2x^2 - x - 2 - (2x^2 - 4x - 3) = 3x + 1$ M1

∴ Draw $y = 3x + 1$ correctly B1 ft

$x = 2.6$ and -0.6 A1

*Accept
2.55 to 2.65, -0.55 to -0.65*

[5]

2.

$x < -3, x > 6$	M1 Rearrange to $x^2 - 3x - 18 > 0$
	M1 Correct method to solve $x^2 - 3x - 18 = 0$
	M1 Establish critical values -3 and 6
	A1 $x < -3, x > 6$

3.

$2(x + 3) + 3(x - 4)$ *Allow one error.* M1
No brackets must be recovered
 $2(x + 3) + 3(x - 4) = 6$ is M2

$5x - 6$ *oe* A1

Their ' $5x - 6 = 6$ ' M1dep
*M1 dep for = 6. NB $5x = 7$ implies A1
if RHS = 1 and 1 awarded*

$(x =)1\frac{2}{5} = 2.4$ *ft 'their $5x - 6 = 6$ if both Ms awarded.* A1ft

[4]

4.

(a) $(x + 3)^2$ B1

(b) Gradient ≈ -3
 Or y intercept ≈ 2 M1
Line steeper than $y = -x$

Complete correct A1
*Must pass through intercept on x axis and look symmetrical
about the x axis*

[3]

5.

(a) $(a =) 3$
 $(b =) -12$

B1
 B1

(b) $(x + 3)^2 = 12$ or
 $(x =) \frac{-6 \pm \sqrt{6^2 - 4(1)(-3)}}{2}$

M1

using their values from (a)
Substitution into formula (allow 1 error)

$x + 3 = \sqrt{12}$
 or $(x =) \frac{-6 \pm \sqrt{36 + 12}}{2}$

DM1

using their values from (a)

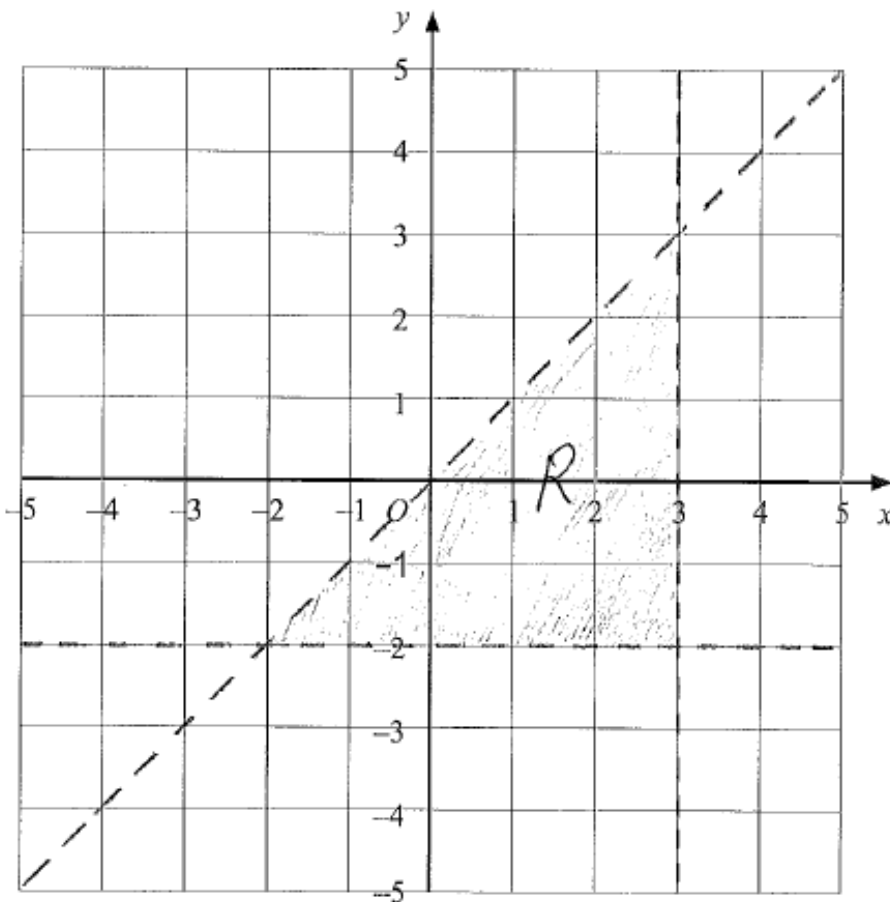
$(x =) \pm\sqrt{12} - 3$
 or $\frac{-6 \pm \sqrt{48}}{2}$

A1

or $-3 \pm 2\sqrt{3}$

[5]

6.



- Vertical line at 3 [B1]
- Horizontal line at -2 [B1]
- Diagonal line $y = x$ as shown [B1]
- All lines drawn are dotted [B1]
- Correct region labelled [A1]

7.

- | | | |
|-----|----|----|
| (a) | 45 | B1 |
| (b) | 53 | B1 |
| (c) | 90 | B1 |
| (d) | 80 | B1 |

[4]

8.

$\begin{matrix} 3 & -4 \\ -2 & 6 \end{matrix}$	6 6 AO1.3b	M1 for $x^2 - 3x - 4 = 2 - 2x$ oe M1 for $x^2 - x - 6 = 0$ M2 for $(x - 3)(x + 2)$ [=0] or M1 for two brackets which gives three correct terms from their quadratic equation A1 for $x = 3$ and -2
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9.

- Height = $100 \times 3 \div 25$ M1
Alternative: B1 for length of median of side
- = 12 (= 12.25) A1
- Diagonal base = $\sqrt{50} = 7.07$
 (or half base = 3.535...)
M1 for pythagoras on half of side triangle.
- $x = \sqrt{(12^2 + 3.535^2)}$ M1
 $x = \sqrt{(12.25^2 + 2.5^2)}$
- = 12.5 A1

[5]

10.

- LHS $x(x - 1) - 2(x + 1)$ M1
Give M1 for $x^2 - 3x + 2$ if first line seen
Allow invisible bracket if recovered.
- LHS = $x^2 - 3x - 2$ A1
Terms need not be collected. e.g. $x^2 - x - 2x - 2$
- $(x - 1)(x + 1) (= x^2 - 1)$ M1
On RHS or as denominator.
 $x^2 - 1$ can be written as $x^2 - x + x - 1$
- Their $(x^2 - 3x - 2) =$ their $(x^2 - 1)$ DM1
Dependent on first 2 M1's
- $-\frac{1}{3}$ (= 0.33(3...)) A1
Do not follow through.
NB 'cancelling' x^2 on top and bottom of

$$\frac{x^2 - 3x - 2}{x^2 - 1} = 1$$

Gives correct answer. Give M1, A1, M1. M0, A0.

[5]