Verulam School

MIxed Algebra 2 ms

0 min
0 marks

1. (a) $xy = 5 + x$ M1

$x(y – 1) = 5$ M1

$x = 5/(y – 1)$ A1

(b) $9x^4y^8$ B2

or $?x^4y^8$
B1
or $9x^?y^8$
B1
or $9x^4y^?$
B1

[5]

2. $y^2 = (3x – 1)^2$ M1

$9x^2 – 3x – 3x + 1$ A1

$x^2 + 9x^2 – 6x + 1 = 16$ M1

$10x^2 – 6x – 15 = 0$ A1

$x = 6 \pm \sqrt{(636)} \div 20$ M1

Allow one error in formula

x = – 0.96 and 1.56 A1

y = – 3.88 and 3.68 A1

Must have y values for last A1

[7]

3. (a) (i) $y = 2x + 1$ drawn M1

– 0.6 or – 0.5 A1

3.5 or 3.6 A1

(ii) $x^2 - 3x - 2 = 0$ B1

(b) x = 0.38, 2.6 from quadratic formula B1

If expanded then should get $x^2 - 3x + 1 = 0 = 0$
M1

x = 0.4 to 0.5, 2.3 to 2.5 from graph B1

A1 both answers.
s.c.– 1.62 and 0.6 gets B1

[6]

4. (a) $A(-4, 0)$ B1

or $2y = 4$ <u>and</u> $-x = 4$ seen

$B(0,2)$ B1

SC1 reversed answers

(b) (their difference in y's) ÷
(± their difference in x's) M1

or attempt to rearrange $2y - x = 4$ to y
$= 0.5x + 2$ <u>and</u> $2y = 4 + x$ <u>or</u> $y - 0.5x$
$= 2$ seen
ft condone A(0, ?) and/or B(?, 0)
from (a)

0.5 or $\frac{1}{2}$ A1ft

ft for $0 < \text{gradient} < 1$ only

[4]

5. (a) $7(x + 2)$ B1

allow one error

(b) $4m + 12 + 6m - 15$ M1

$10m - 3$ A1

allow $10m + {}^{-}3$

(c) $6x + 9y = 27$ and $6x + 4y = 2$ or $4x + 6y = 18$ and $9x + 6y = 3$ M1

$5y = 25$ or $5x = –15$ M1dep

$y = 5$ or $x = – 3$ A1

$x = – 3$ and $y = 5$ A1

SC1 correct answer with no working or using T&I

(d) $(x + 8)(x – 2)$ B2

B1 $(x \pm 8)(x \pm 2)$

[9]

6. (a) $4m + 12 + 6m – 15$ M1

Allow one error

$10m – 3$ A1

Allow 10m + -3

(b) $6x + 9y = 27$ and $6x + 4y = 2$ or $4x + 6y = 18$ and $9x + 6y = 3$ M1

Allow one error in <u>either</u> first

$5y = 25$ <u>or</u> $5x = –15$ M1dep

<u>or</u> second method mark

$y = 5$ <u>or</u> $x = –3$ A1

$x = –3$ <u>and</u> and $y = 5$ A1

***SC1** correct answers only or correct answers by T&I*

(c) (i) $(x + 8)(x – 2)$ B2

B1 for $(x \pm 8)(x \pm 2)$

(ii) $x = –8$ <u>and</u> $x = 2$ B1

ft. from their factors, must have both solutions

[9]

7. (a) Any correct attempt at
(y-step) ÷ (x-step) M1

Might be marked on diagram

–2 A1

(b) $y = -2x + 3$ B1

ft. their gradient

(c) Gradient = $\frac{1}{2}$ M1

Attempt at gradient of perpendicular line, ft. from their gradient in part (a) using ($m_1 \times m_2 = -1$) as long as there is no contradiction between parts (a) and (b)

$y = \frac{1}{2}x + 3$ A1 ft

or equivalent

[5]

8. (a) $W \propto \sqrt{P}$ or $W = k\sqrt{P}$ M1

$12 \propto \sqrt{16}$ or $12 = k\sqrt{16}$ acceptable for M1

$k = 3$ A1

$W = 3\sqrt{P}$ A1

ft their k, but must be formally stated

Accept equivalent form eg. $P = (W/3)^2$

(b) $W = 15$ B1

ft. their k

(c) $\sqrt{P} = 21 \div 3$ or $\sqrt{P} = 7$ B1

allow 21 ÷ (their k)

$P = 49$ B1

ft. for their $\sqrt{P}$ value " squared"

[6]

9. (a) Attempt at translation of 45° to the right M1

$P = (135,1)$ A1

(b) Attempt at sine curve of twice the amplitude of the original M1

P = (90, 2) A1

[4]

10. $a = 5$ B1

from expansion $x^2 - 2ax + a^2$ and comparing coeffs.
or simply spotting that $a = 5$

$b = -7$ B1ft

ft. from their a using $a^2 + b = 18$
ie. $b = 18 - a^2$
or by inspection

[2]