



[Q1 – Q23]

1. The point A has co-ordinates $(-4, 6)$ and the point B has co-ordinates $(7, -2)$.
Calculate the length of the line AB in surd form . [3]
0580/21/M/J/15 Q8)

2. A is the point $(7, 12)$ and B is the point $(2, -1)$. Find the length of AB in surd form [3]
0580/23/M/J/19 Q15)

3. Find the mid-point of AB where A (w, r) and B $(3w, t)$.
Give your answer in its simplest form in terms of w, r and t [2].
0580/22/O/N/18 Q10

4. A line has gradient 5. M and N are two points on this line.
M is the point $(x, 8)$ and N is the point $(k, 23)$.
Find an expression for x in terms of k . [3]
0580/21/M/J/17 Q12)

5. Find the equation of the line passing through the points with co-ordinates $(5, 9)$ and $(-3, 13)$. [3]
0580/23/M/J/14 Q13)



6. (a) Find the co-ordinates of the point where the line $y = 3x - 8$ crosses the y -axis. [1]

(b) Write down the gradient of the line

$$y = 3x - 8 \quad [1]$$

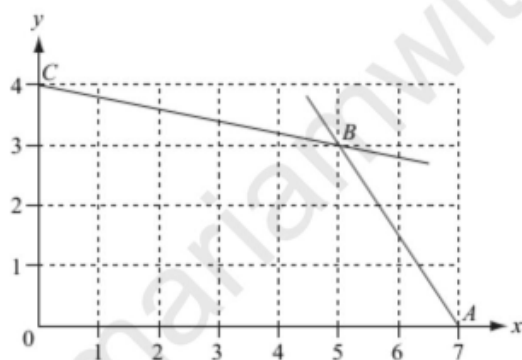
0580/23/M/J/19 Q5)

7. Find the gradient of a line that is perpendicular to $8y + 4x = 5$ [2]

0580/21/O/N/20 Q14)

8. The lines AB and CB intersect at B.

(a) Find the co-



ordinates of the midpoint of AB. [1]

(b) Find the equation of the line CB. [3]

0580/22/M/J/11 Q18

9. A (5, 23) and B (−2, 2) are two points.
- (a) Find the co-ordinates of the midpoint of the line AB. [2]
- (b) Find the equation of the line AB. [3]
- (c) Show that the point (3, 17) lies on the line AB. [1]

0580/22/O/N/13 Q18

10. (a) A has coordinates (−2, 7), B has coordinates (1, −5) and C has coordinates (5, 4).
- (i) Find the coordinates of the midpoint of the line AB. [2]
- (ii) Find \overline{AC} . [2]
- (iii) Find $|\overline{AC}|$. [2]
- (iv) Find the equation of the line AB. Give your answer in the form $y = mx + c$. [3]
- (v) Find the equation of the line perpendicular to AB that passes through C. Give your answer in the form $y = mx + c$. [3]

0580/43/M/J/22 Q8



11. Two points A and B have co-ordinates A (3, 2) and B (5, 6)
- (a) B is the mid-point of the line AC.
Find the co-ordinates of C. [2]
- (b) Find the equation of the straight line that passes through A and B. [3]
- (c) The straight line that passes through A and B cuts the y -axis at D.
Write down the co-ordinates of D. [1]

0580/43/O/N/18 Q1

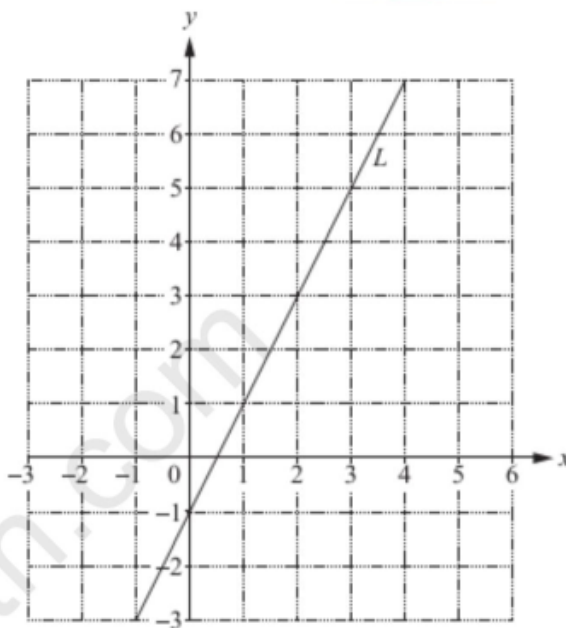
12. (a) Find the co-ordinates of the midpoint of the line joining
A(-8, 3) and B(-2, -3). [2]
- (b) The line $y = 4x + c$ passes through (2, 6).
Find the value of c. [1]
- (c) The lines $5x = 4y + 10$ and $2y = kx - 4$ are parallel.
Find the value of k. [2]

0580/22/M/J/12 Q17)



13. (a) Work out the gradient of the line L. [2]
(b) Write down the equation of the line parallel to the line L that passes through the point (0, 6). [2]

0580/23/M/J/16 Q18)



14. A is the point (2, 3) and B is the point (7, -5).

- (a) Find the co-ordinates of the midpoint of AB. [2]
(b) Find the equation of the line through A that is perpendicular to AB.

Give your answer in the form $y = mx + c$ [4]

0580/22/F/M/19 Q23)



15. A line from the point (2, 3) is perpendicular to the line

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

The two lines meet at the point P.

Find the coordinates of P. [5]

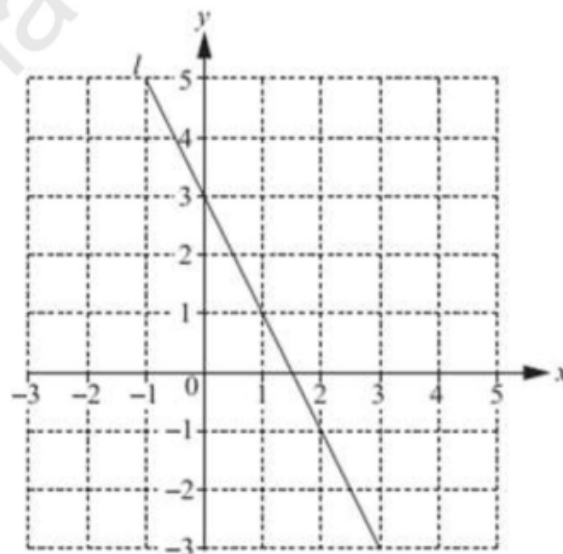
0580/22/O/N/20 Q24)

16. (a) Find the equation of the line l. [3]

(b) A line perpendicular to the line l passes through the point (3, -1). Find the equation of this line.

Give your answer in the form $y = mx + c$. [3]

0580/22/F/M/17 Q20)





17. A line joins the points $A(3,8)$ and $B(2,2)$.

(a) Find the co-ordinates of the midpoint of AB. [2]

(b) Find the equation of the line through A and B.

Give your answer in the form $y = mx + c$ [3]

(c) Another line is parallel to AB and passes through the point $(0, 7)$.

Write down the equation of this line. [2]

(d) Find the equation of the line perpendicular to AB which passes through the point $(1, 5)$.

Give your answer in the form $ax + by + c = 0$ where a, b and c are integers. [4]

0580/41/M/J/17 Q7)

18. Line A has equation $y = 5x - 4$

Line B has equation $3x + 2y = 18$

(a) Find the gradient of

(i) line A, [1]

(ii) line B. [1]

(b) Write down the co-ordinates of the point where line A crosses the x -axis. [2]

(c) Find the equation of the line perpendicular to line A which passes through the point $(10, 9)$.

Give your answer in the form $y = mx + c$. [4]

(d) Work out the co-ordinates of the point of intersection of line A and line B. [3]

(e) Work out the area enclosed by line A, line B and the y -axis. [3]

0580/43/O/N/17 Q8)



19. A is the point $(-2, 0)$ and B is the point $(0, 4)$.

(a) Find the equation of the straight line joining A and

B. [3]

(b) Find the equation of the perpendicular bisector of

AB. [4]

0580/22/M/J/17 Q27

20. A is the point $(4, 1)$ and B is the point $(10, 15)$. Find the equation of the perpendicular bisector of the line AB

[6]

0580/21/M/J/16 Q25)

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21. AB is a line with midpoint M.

A is the point (2, 3) and M is the point (12, 7).

(a) Find the coordinates of B. [2]

(b) Show that the equation of the perpendicular bisector of AB is $2y + 5x = 74$. [4]

(c) The perpendicular bisector of AB passes through the point N. The point N has coordinates (2, n).

Find the value of n. [1]

(d) Points A, M and N form a triangle. Find the area of the triangle. [2]

0580/42/O/N/22 Q8(a)

22. A kite is drawn on a coordinate grid.

The diagonals of the kite intersect at the point $(-2, -5)$.

One diagonal has equation $y = 4x + 3$.

Find the equation of the other diagonal of the kite.

Give your answer in the form $y = mx + c$. [3]

0580/23/O/N/22 Q16)



23. P is the point (16, 9) and Q is the point (22, 24).

(a) Find the equation of the line perpendicular to PQ that passes through the point (5, 1).

Give your answer in the form $y = mx + c$ [4]

(b) N is the point on PQ such that $PN = 2NQ$.

Find the co-ordinates of N. [2]

0580/22/M/J/18 Q25)

24. (a) Point A has co-ordinates (1, 0) and point B has co-ordinates (2, 5).

Calculate the angle between the line AB and the x -axis. [3]

(b) The line PQ has equation $y = 3x - 8$ and point P has co-ordinates (6, 10).

Find the equation of the line that passes through P and is perpendicular to PQ.

Give your answer in the form $y = mx + c$. [3]

0580/21/M/J/18 Q24)



[Q24 – Q28]



25. A line, l , joins point $F(3,2)$ and point $G(-5,4)$.

(a) Calculate the length of line l . [3]

(b) Find the equation of the perpendicular bisector of line l in the form $y = mx + c$. [5]

(c) A point H lies on the y -axis such that the distance $GH = 13$ units.

Find the coordinates of the two possible positions of H . [4]

0580/42/M/J/22 Q3)

26. (a) A rhombus $ABCD$ has a diagonal AC where A is the point $(-3, 10)$ and C is the point $(4, -4)$.

(i) Calculate the length AC . [3]

(ii) Show that the equation of the line AC is $y = -2x + 4$ [2]

(iii) Find the equation of the line BD . [4]

0580/41/M/J/20 Q10)



27. A straight line joins the points A(-2, -3) and C(1, 9).

(a) Find the equation of the line AC in the form $y = mx + c$. [3]

(b) Calculate the acute angle between AC and the x -axis. [2]

(c) ABCD is a kite, where AC is the longer diagonal of the kite. B is the point (3.5, 2).

(i) Find the equation of the line BD in the form $y = mx + c$. [3]

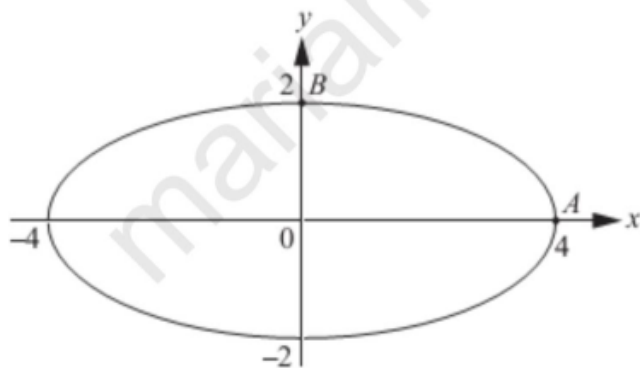
(ii) The diagonals AC and BD intersect at (-0.5, 3).

Work out the co-ordinates of D. [2]

0580/43/M/J/19 Q7)

28. The diagram shows a curve with equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

(a) A is the point (4, 0) and B is the point (0, 2)



(i) Find the equation of the straight line that passes through A and B.

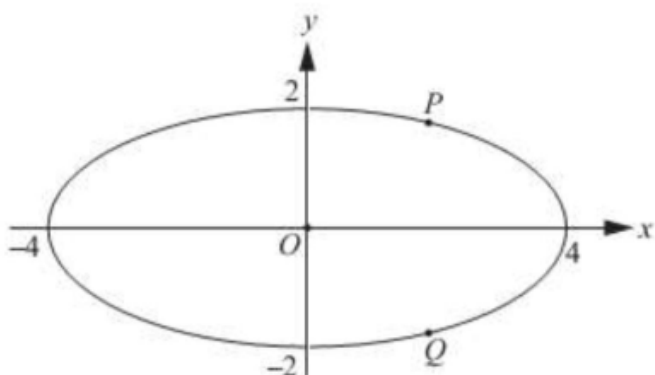


Give your answer in the form $y = mx + c$. [3]

(ii) Show that $a^2 = 16$ and $b^2 = 4$. [2]

(b) $P(2, k)$ and $Q(2, -k)$ are points on the curve $\frac{x^2}{16} +$

$$\frac{y^2}{4} = 1$$



(i) Find the value of k . [3]

(ii) Calculate angle POQ . [3]

(c) The area enclosed by a curve with equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is πab .

(i) Find the area enclosed by the curve $\frac{x^2}{16} + \frac{y^2}{4} = 1$

Give your answer as a multiple of π . [1]

(ii) A curve, mathematically similar to the one in the diagrams, intersects the x -axis at $(12, 0)$ and $(-12, 0)$. Work out the area enclosed by this curve, giving your answer as a multiple of π [2]

0580/41/M/J/16 Q9)

Answers

1) $\sqrt{185}$	8) (a) (6, 1.5) (b) $y = -1/5x + 4$	15) (2.4, 1.8)	22) $[y =] -\frac{1}{4}x - \frac{11}{2}$
2) $\sqrt{194}$	9) (a)(1.5, 12.5) (b) $y = 3x + 8$	16) (a) $y = -2x + 3$ (b) $y = 1/2x - 5/2$	23) (a) $y = -2/5x + 3$ (b) (20, 19)
3) (2w, (r + t)/2)	10) (a)(i) (-0.5, 1) (ii) $\begin{pmatrix} 7 \\ -3 \end{pmatrix}$ (iii) 7.62 (iv) $[y =] -4x - 1$ (v) $[y =] \frac{1}{4}x + \frac{11}{4}$	17) (a) (2.5, 5) (b) $y = 6x - 10$ (c) $y = 6x + 7$ (d) $x + 6y - 31 = 0$	24) (a) 78.7 (b) $y = -1/3x + 12$
4) $x = k - 3$	11) (a) (7, 10) (b) $y = 2x - 4$ (c) (0, -4)	18) (a)(i) 5 (a)(ii) -3/2 oe (b)(4/5, 0) (c) $y = -0.2x + 11$ (d) (2, 6) (e) 13	25) (a) 8.25 (b) $y = 4x + 7$ (c) (0, -8) and (0, 16)
5) $y = -0.5x + 11.5$ oe	12) (a) (-5, 0) (b) -2 (c) 2.5 or $2\frac{1}{2}$	19) (a) $y = 2x + 4$ (b) $y = -1/2x + 3/2$	26) (a)(i) 15.7 (iii) $y = \frac{1}{2}x + \frac{11}{4}$
6) (a) (0, -8) (b) 3	13) (a) 2 (b) $y = 2x + 6$	20) $y = -3/7x + 11$	27) (a) $y = 4x + 5$ (b) 76.0 (c)(i) $y = -1/4x + 23/8$ (ii) (-4.5, 4)
7) 2	14) (a) (4.5, -1) (b) $y = 5/8x + 7/4$	21) (22, 11)(b)(c) 32(d) 145	28) (a)(i) $y = -1/2x + 2$ (b)(i) 1.73 or $\sqrt{3}$ (ii) 81.8 (c) (i) 8π (ii) 72π