

Past Paper Questions

1. Which of the graphs shown below could be the graph of

(a) $y = x^3$ [1]

(b) $y = 1/x^2$ [1]

(c) $y = x - 1$ [1]

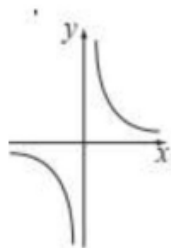


Figure 1

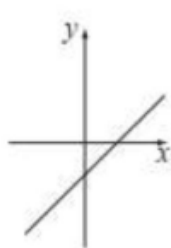


Figure 2

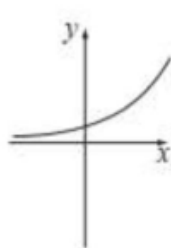


Figure 3

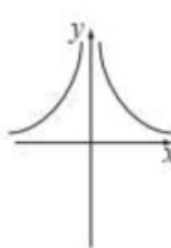


Figure 4



Figure 5



Figure 6

4024/01/O/N/05 Q9

2. Which of the figures shown below could be the graph of

(a) $y = x^2 + 2$, Answer (a) Figure [1]

(b) $y = (x - 2)(x + 1)$, Answer (b) Figure [1]

(c) $y = 2 - x - x^2$, Answer (c) Figure [1]

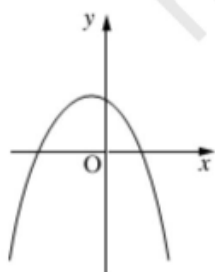


Figure 1

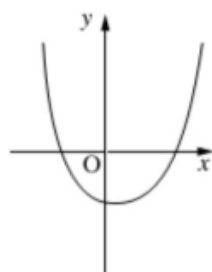


Figure 2

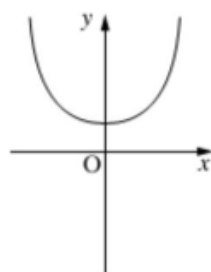


Figure 3

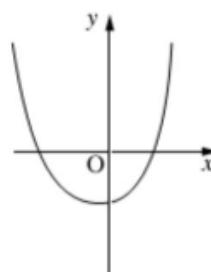


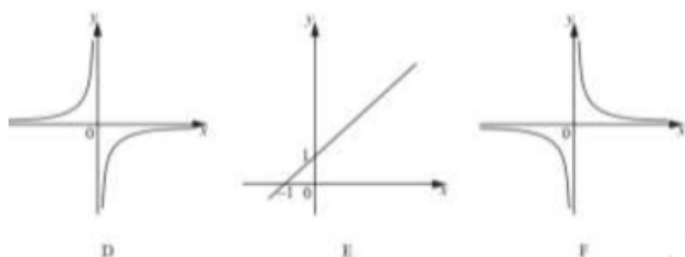
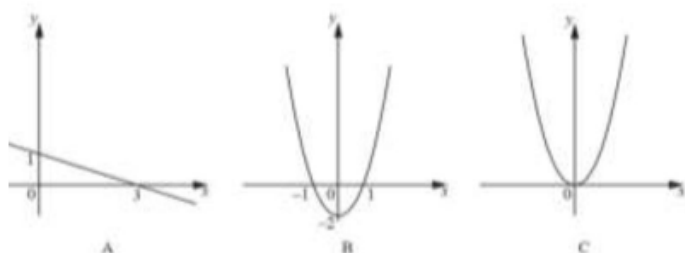
Figure 4

4024/01/M/J/09 Q13



3. The diagrams A, B, C, D, E and F are six graphs of different functions
Complete the table to identify the correct graph of each function. One has been done for you.

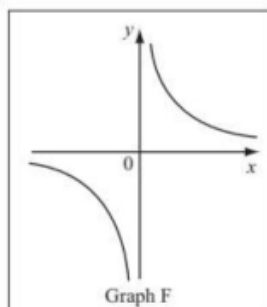
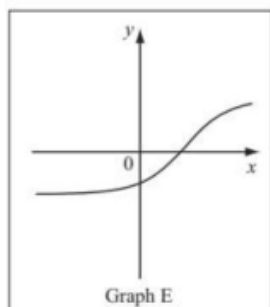
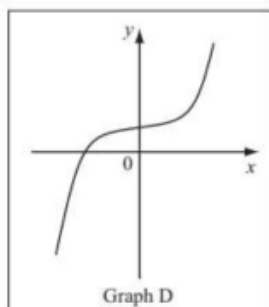
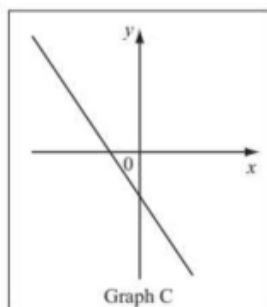
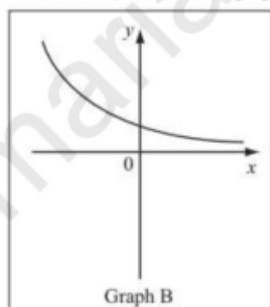
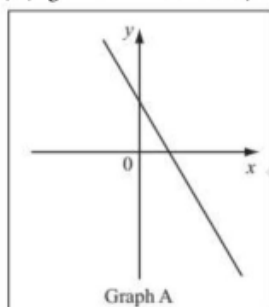
Function	$y = x + 1$	$y = 1 - \frac{x}{3}$	$y = 2x^2$	$y = -4/x$
Diagram	E			



0580/02/SP/20 Q21

4. Write down which of these sketches shows the graph of each of

- (a) $y = 1 - 2x$ Graph [1]
 (b) $y = 1/x, x \neq 0$ Graph [1]
 (c) $y = x^3 + 1$ Graph [1]



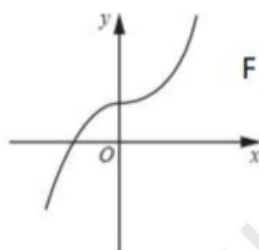
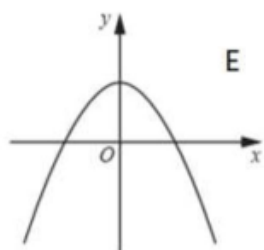
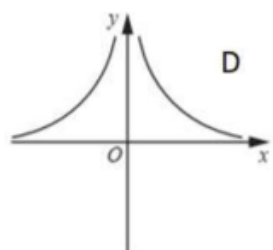
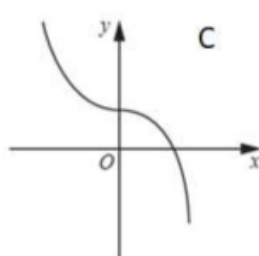
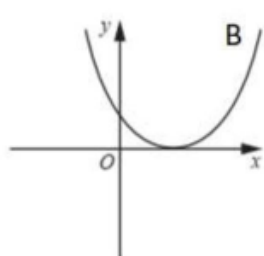
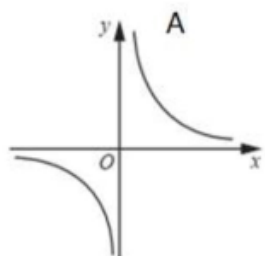
0580/43/M/J/12 Q9(d)

5. State which of the figures below could be the graph of

(a) $y = x^3 + 2$ [1]

(b) $y = 2/x$

(c) $y = 2 - x^2$



4024/11/M/J/18 Q23

6. State which figures could be the graph of

(a) $y = x^3 + 1$ [1]

(b) $y = x^2 - 3$ [1]

(c) $y = 3^x$ [1]

(d) $y = (x - 3)^2$ [1]

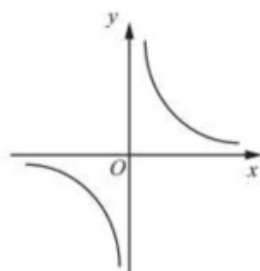


Figure A

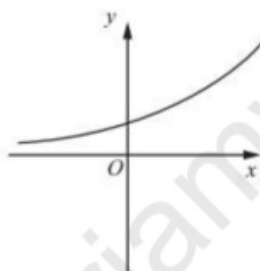


Figure B

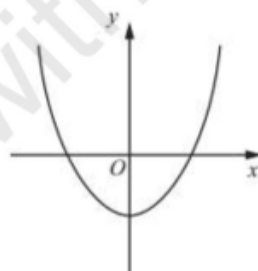


Figure C

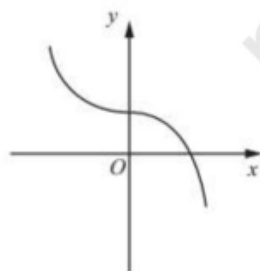


Figure D

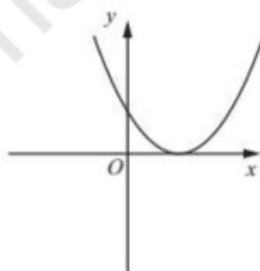


Figure E

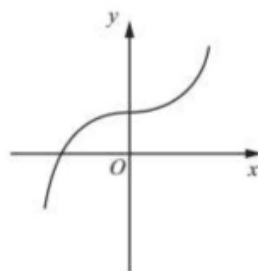
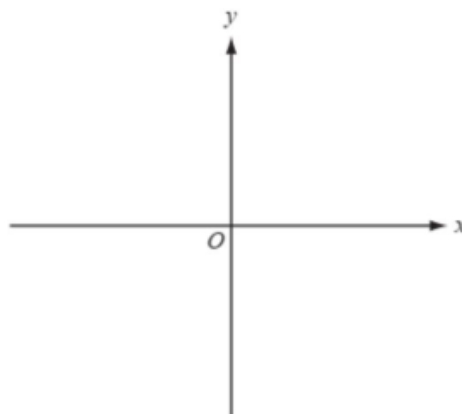


Figure F

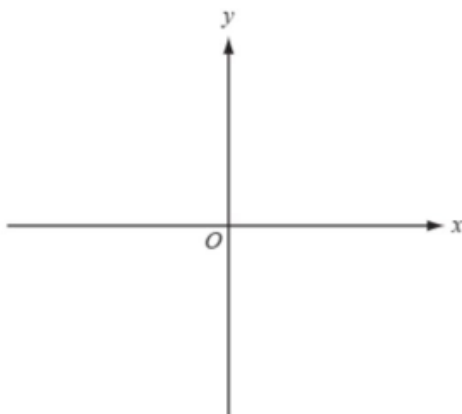
4024/11/O/N/14 Q20



7. $f(x) = 2x - 1$ $g(x) = x^2 + 1$
Sketch the graph of (i) $y = f(x)$ (ii) $y = g(x)$



(i) $y = f(x)$



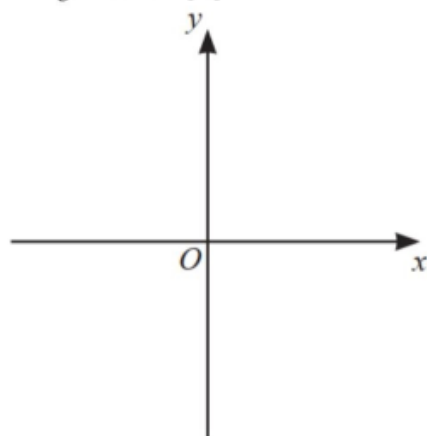
(ii) $y = g(x)$

[3]

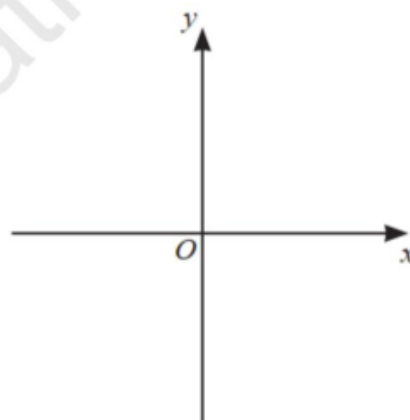
0580/04/M/J/09 Q10 (g)

8. Sketch the graph of each function.

(a) $y = x - 3$ [1]

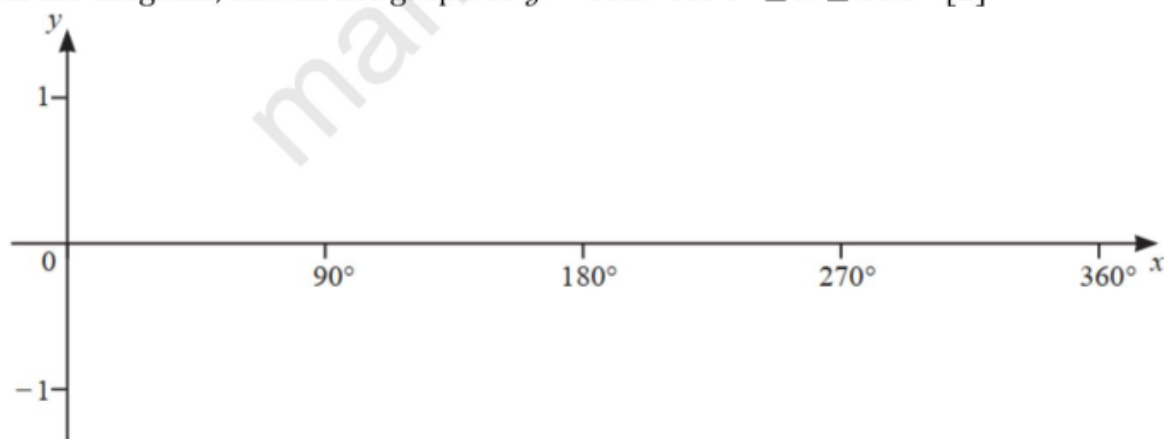


(b) $y = 1/x$ [2]



0580/22/F/M/20 Q10)

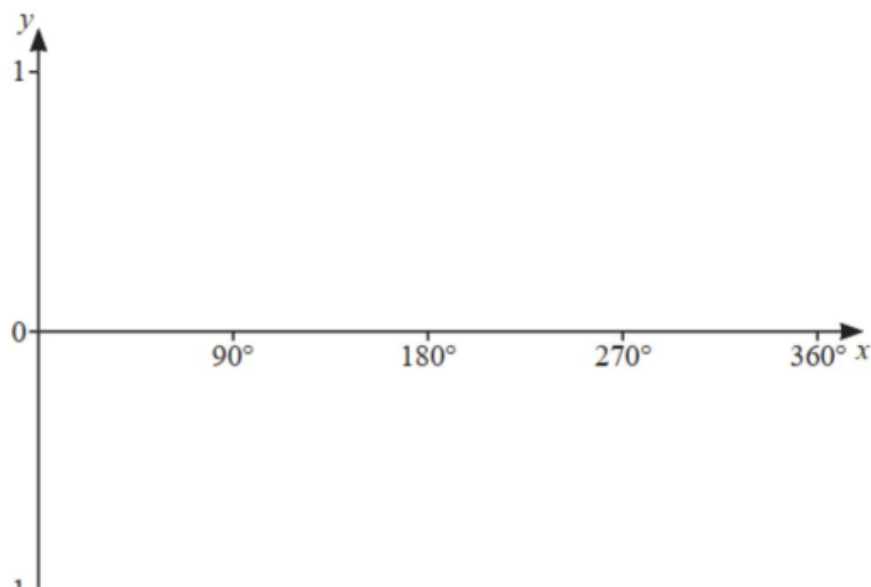
9. On the diagram, sketch the graph of $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$ [2]



0580/22/F/M/20 Q19)

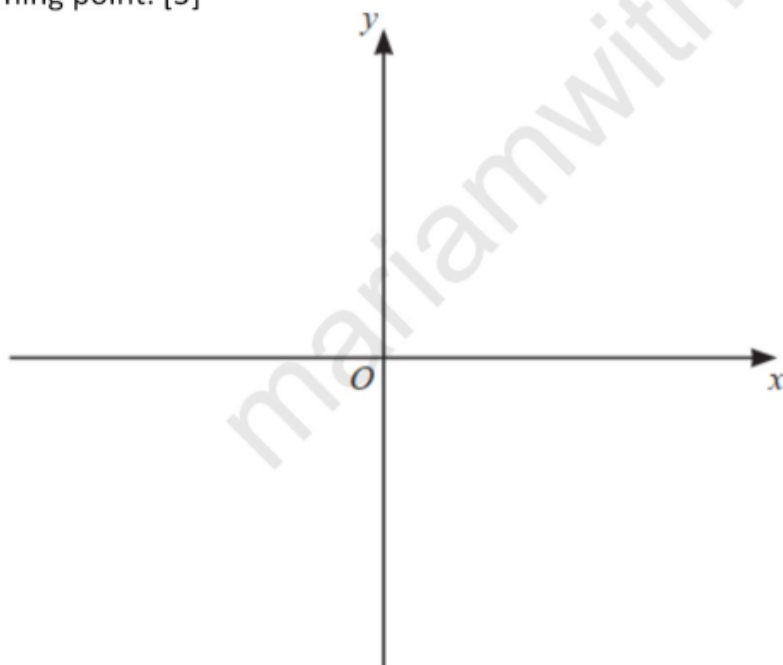


10. (a) On the axes, sketch the graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$ [2]



- (b) Describe fully the symmetry of the graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$ [2]
0580/41/M/J/20 Q7)

11. (i) Write $x^2 + 10x + 14$ in the form $(x + a)^2 + b$. [2]
(ii) On the axes, sketch the graph of $y = x^2 + 10x + 14$,
indicating the coordinates of the
turning point. [3]

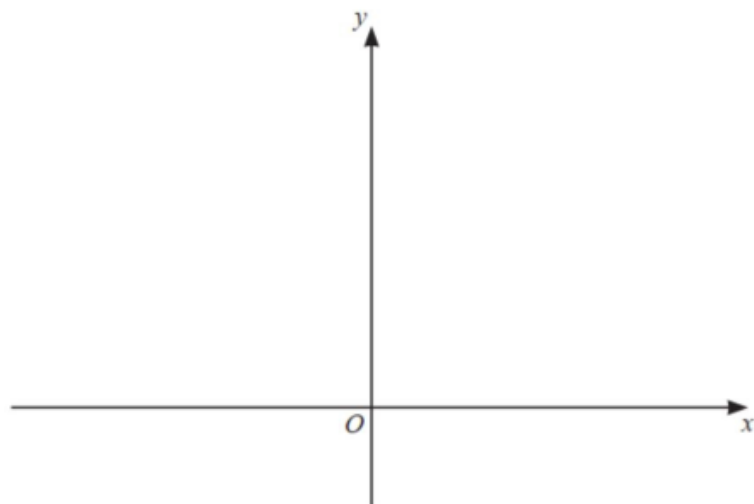


0580/41/M/J/20 Q8 (c)

12. (i) On the diagram

(a) sketch the graph of $y = (x - 1)^2$ [2]

(b) sketch the graph of $y = \frac{1}{2}x + 1$ [2]



(ii) The graphs of $y = (x - 1)^2$ and $y = \frac{1}{2}x + 1$ intersect at A and B.

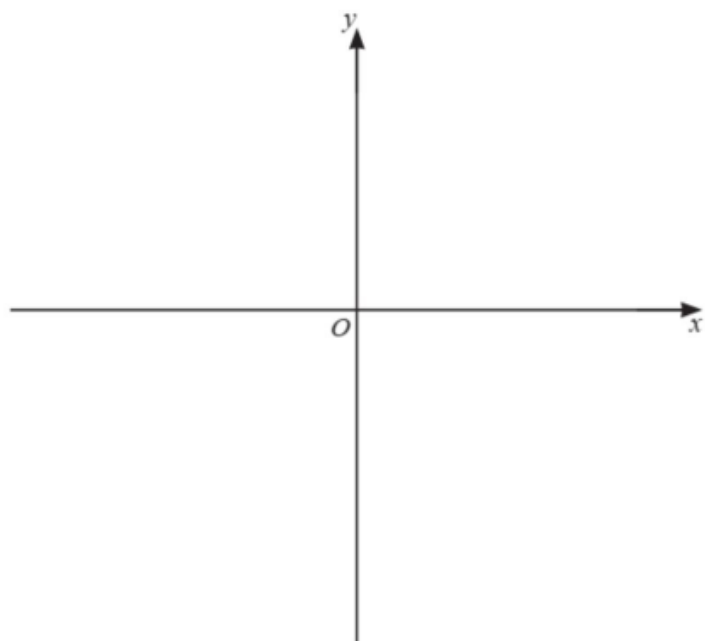
Find the length of AB. [7]

0580/42/M/J/20 Q9 (c)





13. On the diagram, sketch the graph of $y = (x + 1)(x - 3)^2$
Label the values where the graph meets the x-axis and the y-axis.

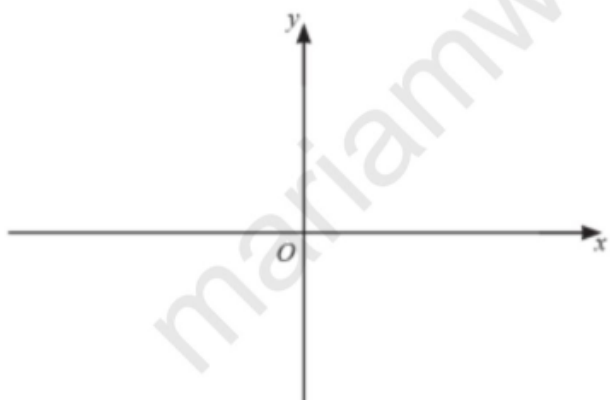


[4]

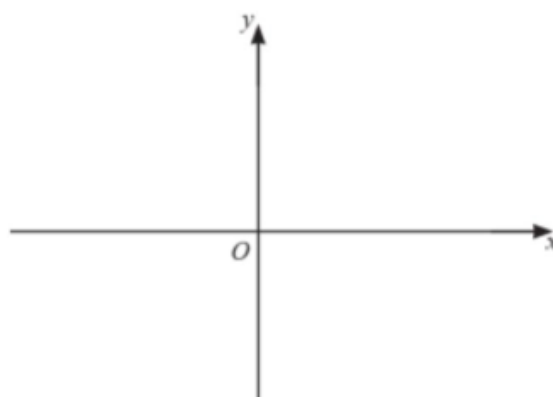
0580/43/O/N/20 Q7

14. On the axes, sketch the graph of each of these functions.

(a) $y = \frac{1}{x}$ [2]



(b) $y = 4^x$ [2]



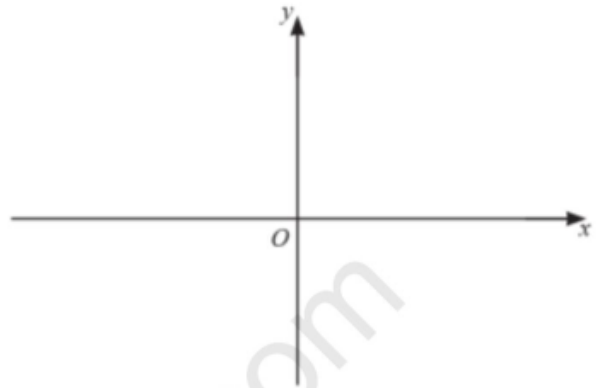
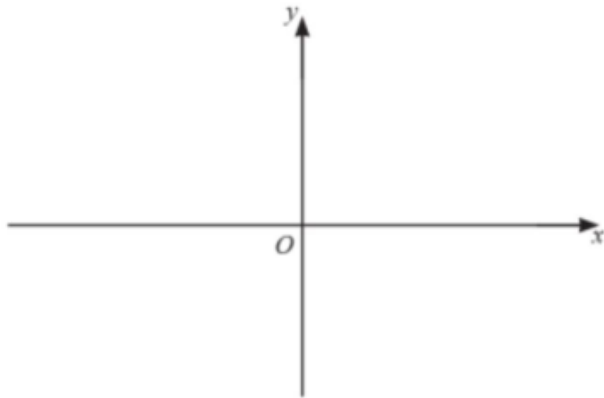
0580/22/F/M/21 Q21)

15. On the axes, sketch the graph of each of these functions.



(a) $y = \frac{2}{x}$ [2]

(b) $y = 2^{-x}$ [2]



0580/23/M/J/21 Q24)

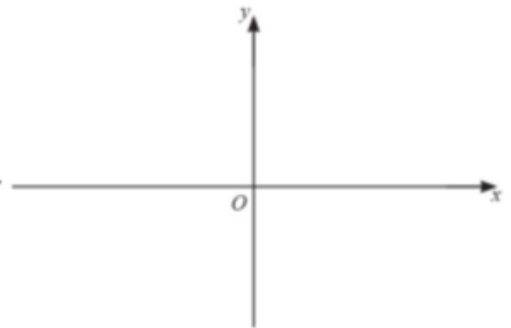
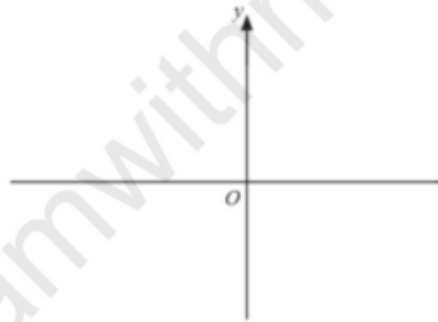
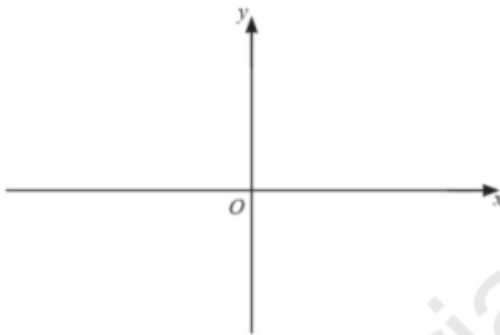
16. Sketch the following graphs.

On each sketch, indicate any intercepts with the axes.

(i) $3x - 4y = 12$ [2]

(ii) $y = x^2 - 3x - 4$ [4]

(iii) $y = 6^x$ [2]



0580/43/O/N/22 Q9(a)



17. The graph of $y = (x - 3)(x + b)(x + 2)$ intersects the y -axis at -30 .

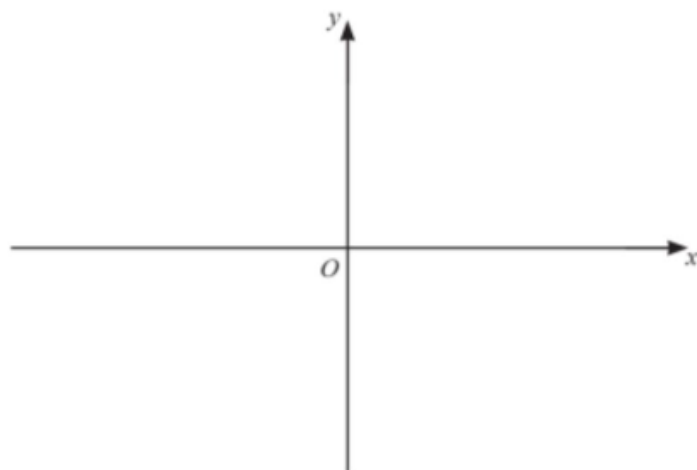
(a) Find the value of b . [2]

(b) When $x > 0$ the graph crosses the x -axis once.

Write down the coordinates of this point. [1]

0580/22/O/N/22 Q11)

18. Sketch the graph of $y = x^3 - 4x$ [3]

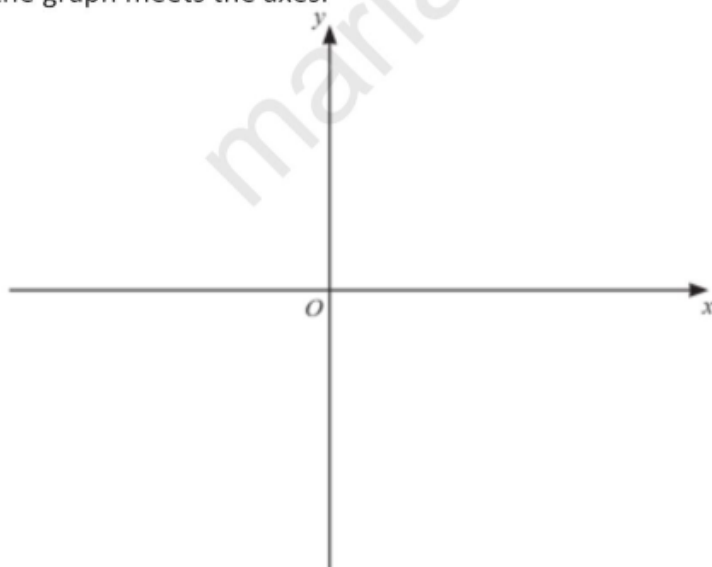


0580/42/F/M/22 Q12(b)

19. (i) The equation $y = x^3 - 4x^2 + 4x$ can be written as $y = x(x - a)^2$. [2]

Find the value of a . [2]

(ii) On the axes, sketch the graph of $y = x^3 - 4x^2 + 4x$, indicating the values where the graph meets the axes.

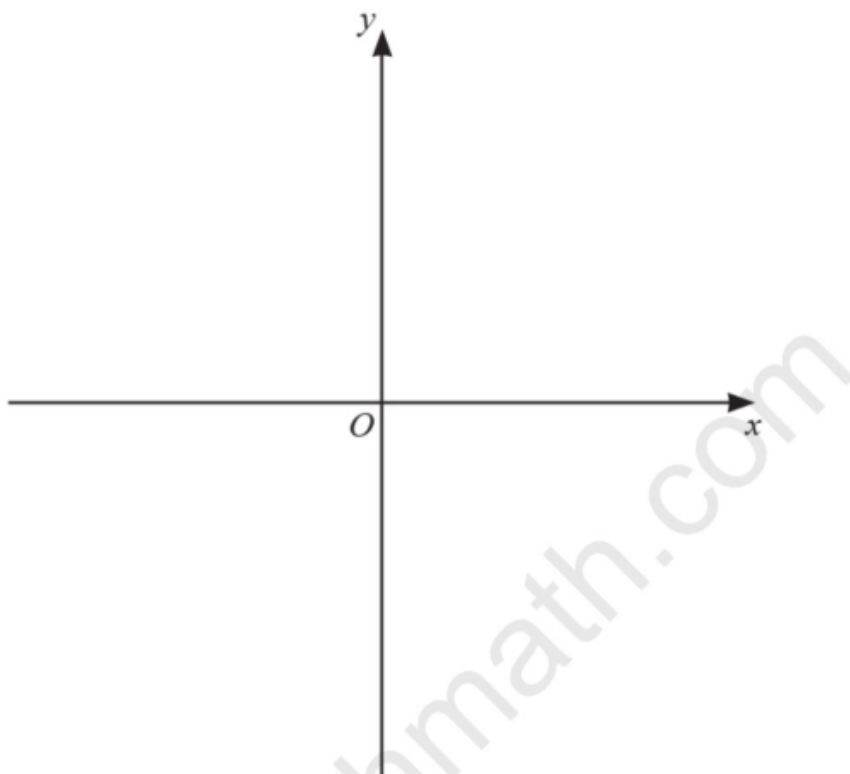


[4]

0580/42/M/J/21 Q9)



20. Sketch the graph of $y = (x + 1)(3 - x)(3 + x)$, indicating the coordinates of the points where the graph crosses the x -axis and the y -axis. [4]

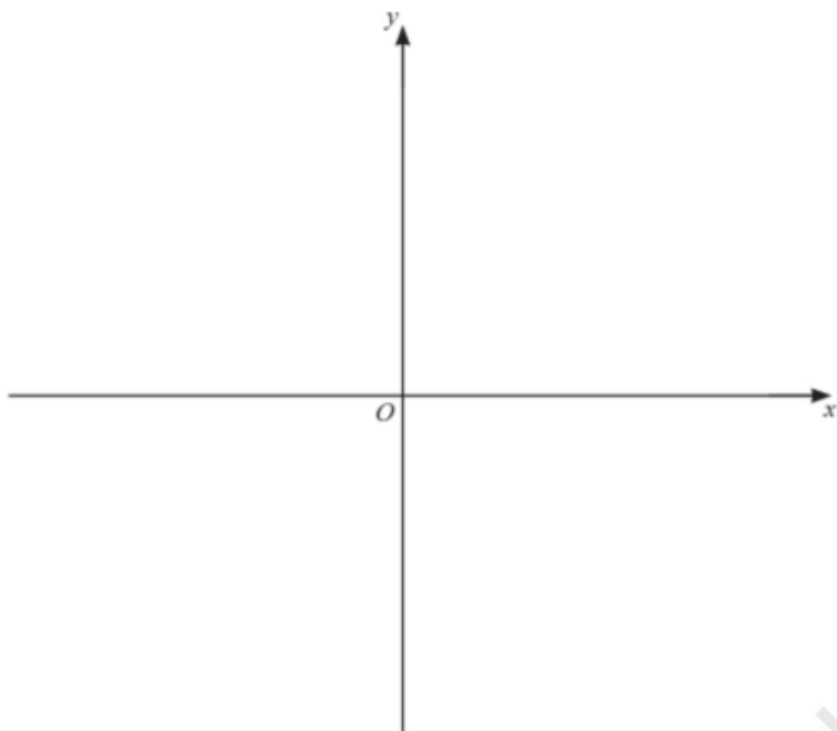


0580/43/M/J/22 Q9(a)

21. $f(x) = x(x - 1)(x - 2)$

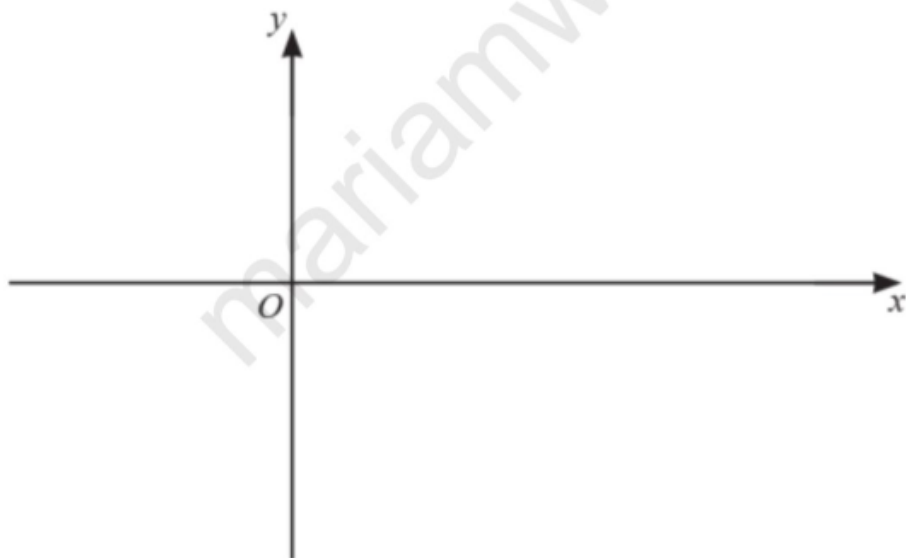
- (a) Find the coordinates of the points where the graph of $y = f(x)$ crosses the x -axis. [2]
(b) Show that $f(x) = x^3 - 3x^2 + 2x$. [2]
(c) Find the coordinates of the turning points of the graph of $y = f(x)$.
Show all your working and give your answers correct to 1 decimal place. [8]
(d) Sketch the graph of $y = f(x)$. [2]





0580/43/O/N/21 Q9)

22. The graph of a cubic function has two turning points. When $x < 0$ and when $x > 4$ the gradient of the graph is positive. When $0 < x < 4$ the gradient of the graph is negative. The graph passes through the origin. Sketch the graph.



0580/21/O/N/22 Q21)

23. A curve has equation $y = x^3 - kx^2 + 1$.

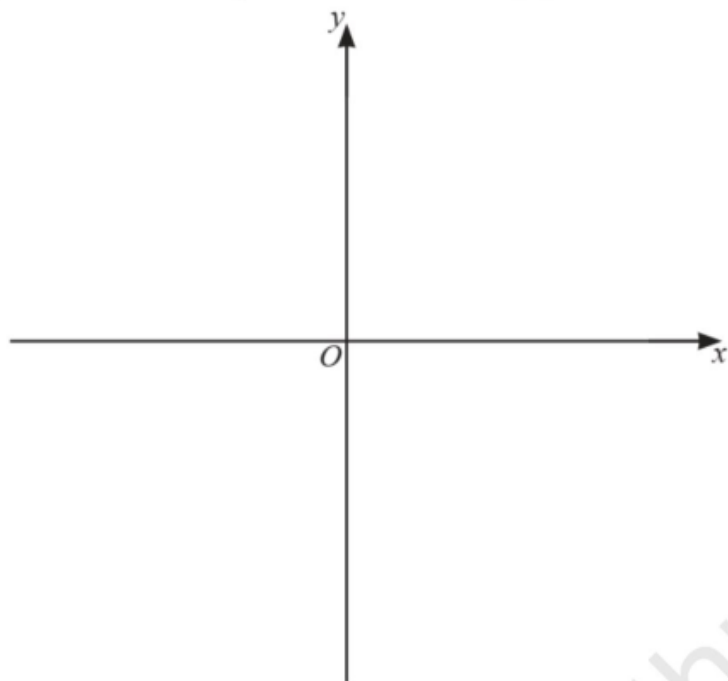
When $x = 2$, the gradient of the curve is 6 .

(a) Show that $k = 1.5$. [5]

(b) Find the coordinates of the two stationary points of $y = x^3 - 1.5x^2 + 1$.

You must show all your working. [4]

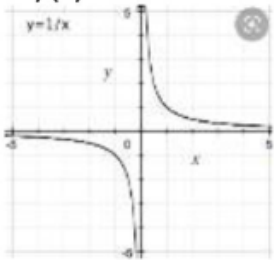
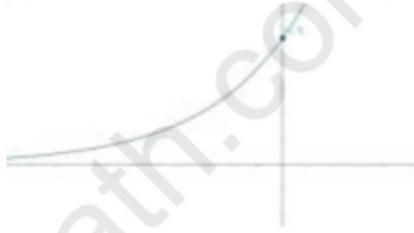
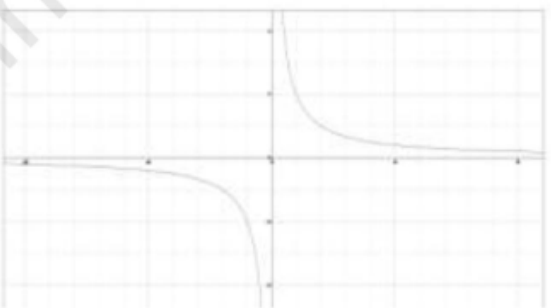
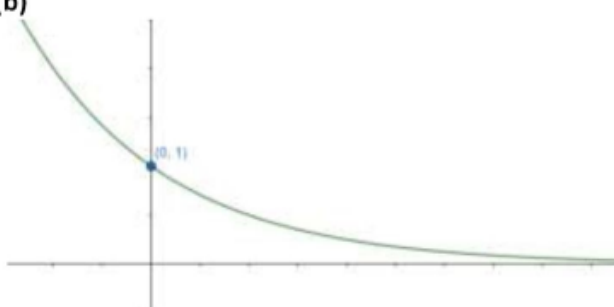
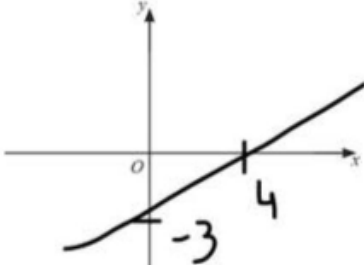
(c) Sketch the curve $y = x^3 - 1.5x^2 + 1$. [2]

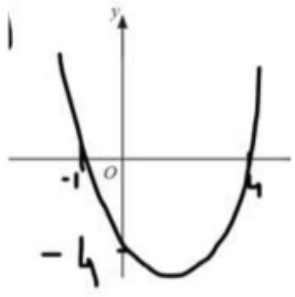
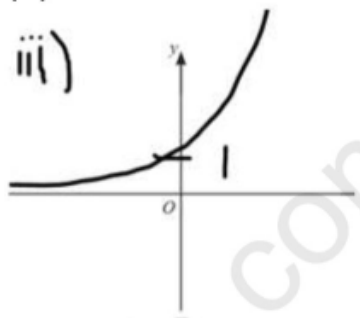
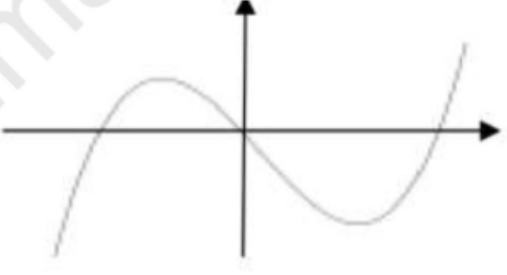
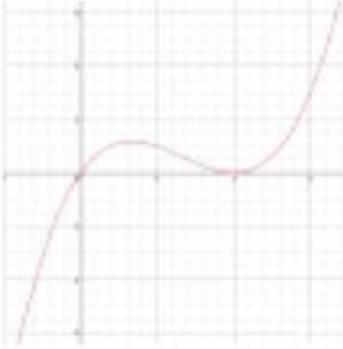
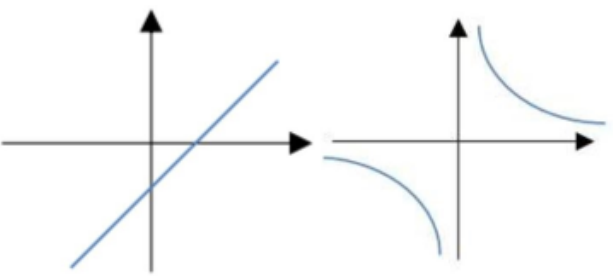
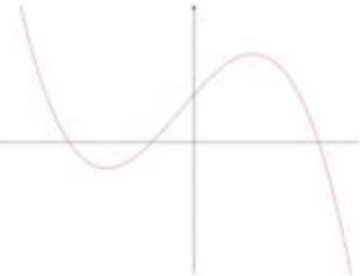


0580/42/M/J/22 Q12)

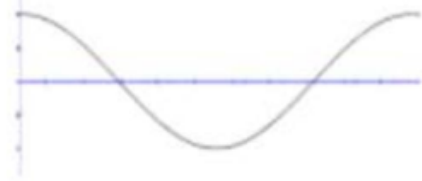
mariamwithmath.com

Answers

<p>1) (a) Fig 6 (b) Fig 4 (c) Fig 2</p>	<p>13) positive cubic shape and max on the y-axis or to the right of y-axis with one root at $(-1, 0)$ and turning point at $(3, 0)$ and y-intercept at $(0, 9)$ all labelled</p>
<p>2) (a) 3 (b) 2 (c) 1</p>	<p>14) (a)</p>  <p>(b)</p> 
<p>3) A, C, D</p>	<p>15) (a)</p>  <p>(b)</p> 
<p>4) A, F, D</p>	<p>16) (i)</p> 

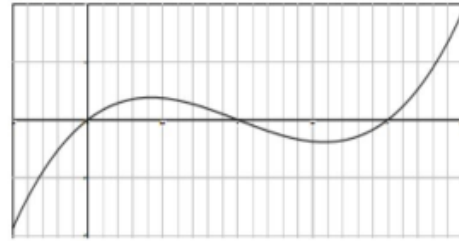
	<p>(ii)</p>  <p>(iii)</p> 
<p>5) (a)F (b)A (c)E</p> <p>6) (a)F (b)C (c)B (d)E</p>	<p>17) (a)5 (b)(3,0)</p> <p>18)</p> 
<p>7) (i) Straight line with positive gradient and (ii) U-shape Parabola ,vertex on positive y-axis</p>	<p>19) (a)(i) 2 (ii)</p> 
<p>8)</p> 	<p>20) Correct sketch of negative cubic crossing the x-axis at $-3, -1$ and 3 and crossing the y-axis at 9</p> 

9)

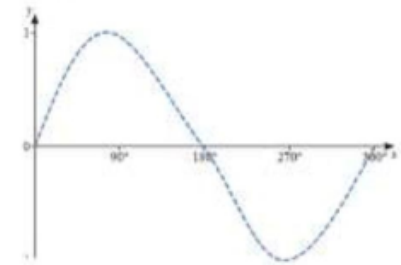


21) (a) (0,0), (1,0), (2,0) (c) (0.4, 0.4) and (1.6, -0.4) (d)

Correct sketch



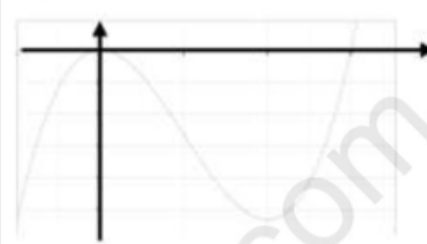
10) (i)



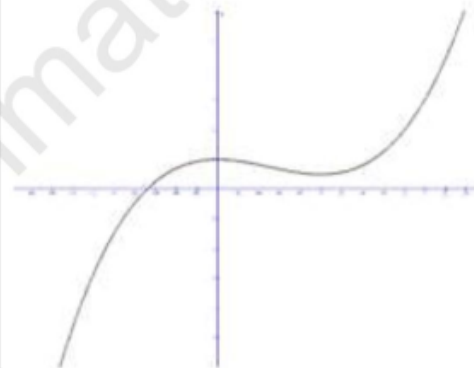
(ii) Rotational [symmetry] order 2 [centre] (180, 0)

11) (i) $(x + 5)^2 - 11$ (ii) Sketch of U-shaped parabola with a minimum indicated at $(-5, -11)$ with no part of graph in 4th quadrant

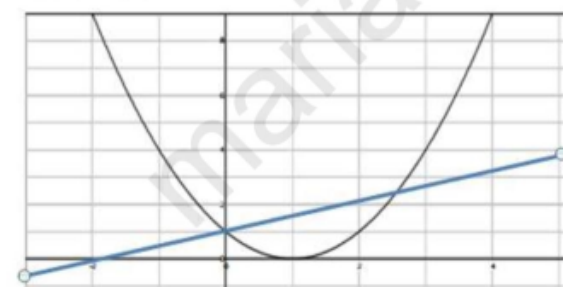
22)



23) (b) (0,1) (1,0.5) (c)



12) (a) & (b)



(c) 2.8[0] or 2.795