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]

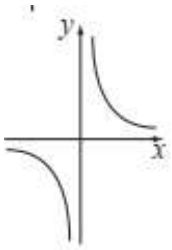


Figure 1

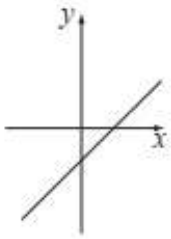


Figure 2

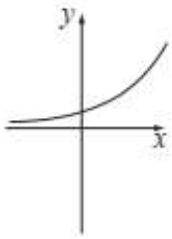


Figure 3

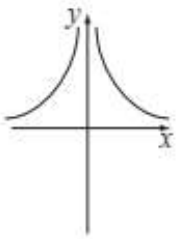


Figure 4

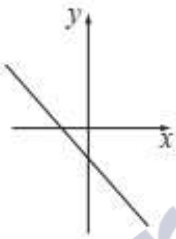


Figure 5

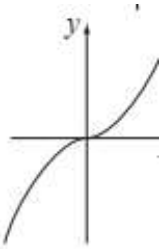


Figure 6

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]

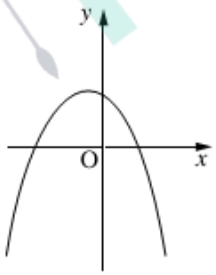


Figure 1

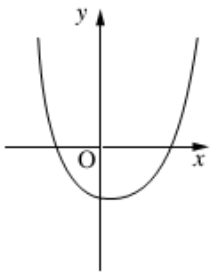


Figure 2

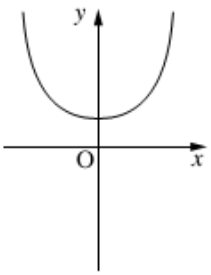


Figure 3

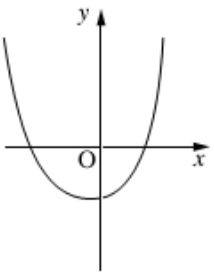


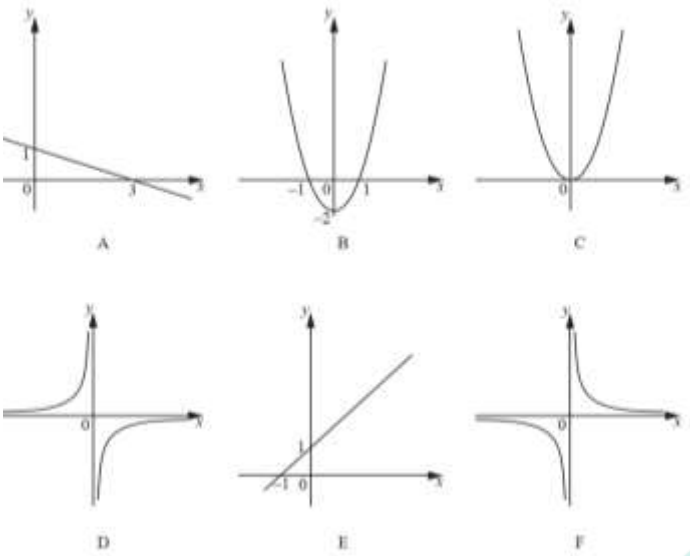
Figure 4

4024/01/M/J/09 Q13

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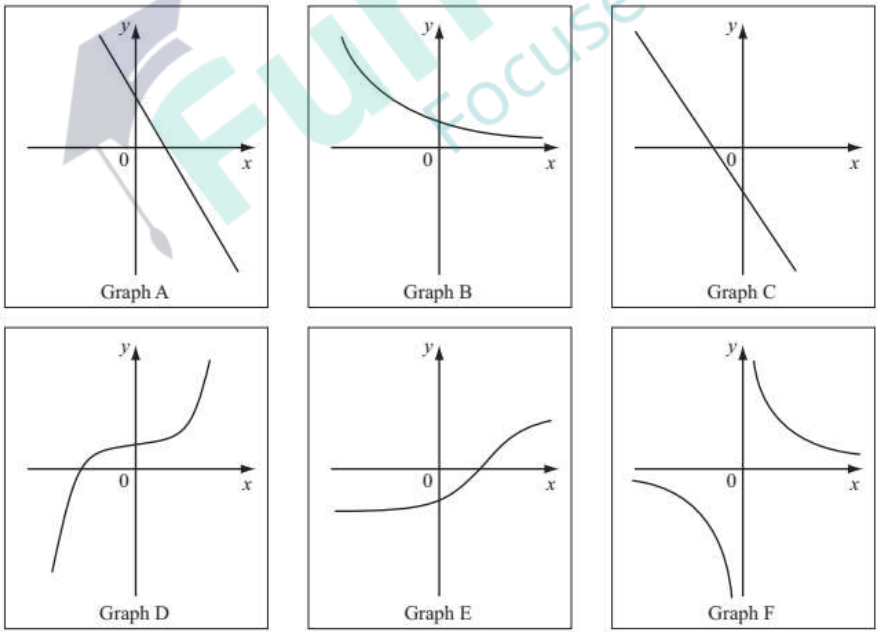
3. The diagrams A, B, C, D, E and F are six graphs of different functions
Complete the table to identify the correct graph of each function. One has been done for you.

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]



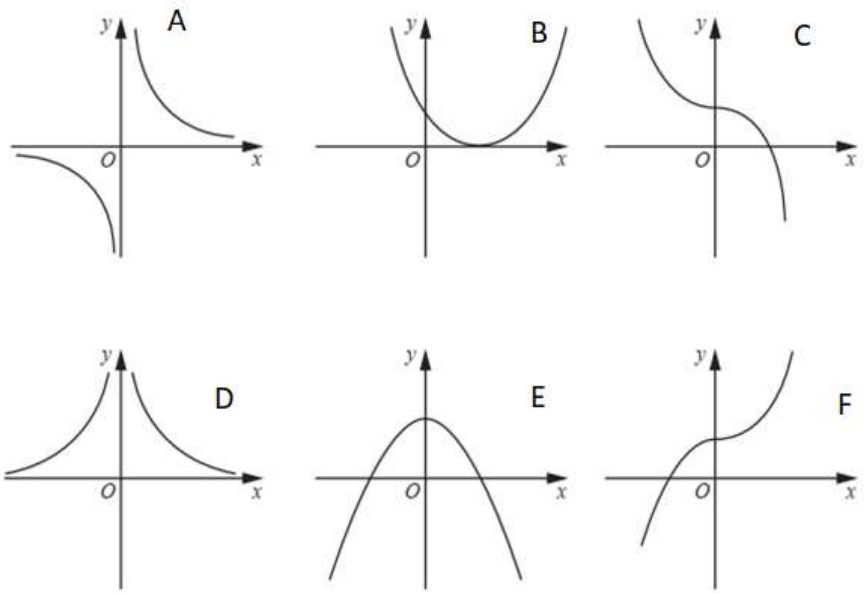
0580/43/M/J/12 Q9(d)

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

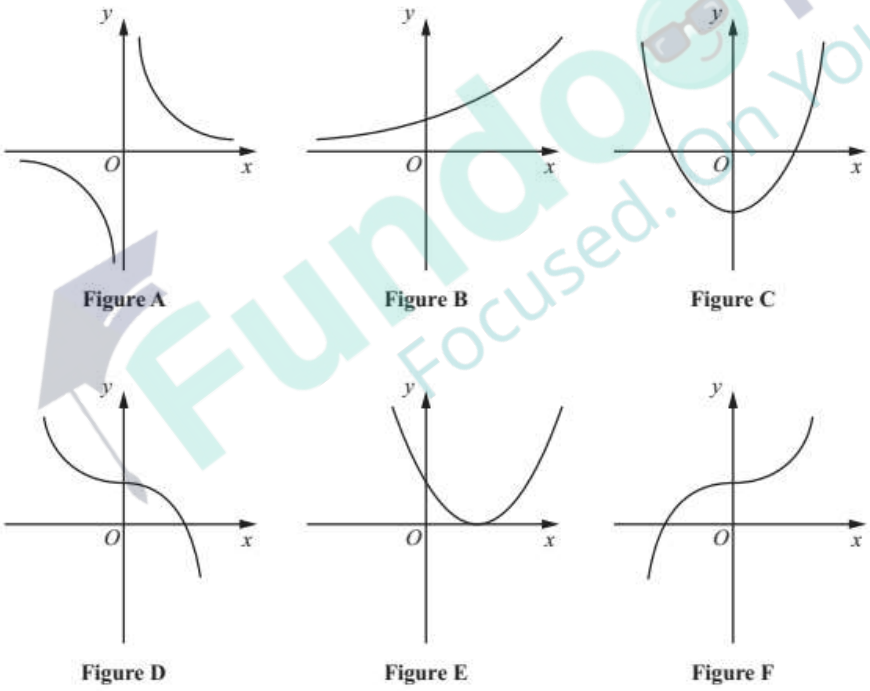


(a) $y = x^3 + 2$ [1] (b) $y = 2/x$ (c) $y = 2 - x^2$



4024/11/M/J/18 Q23

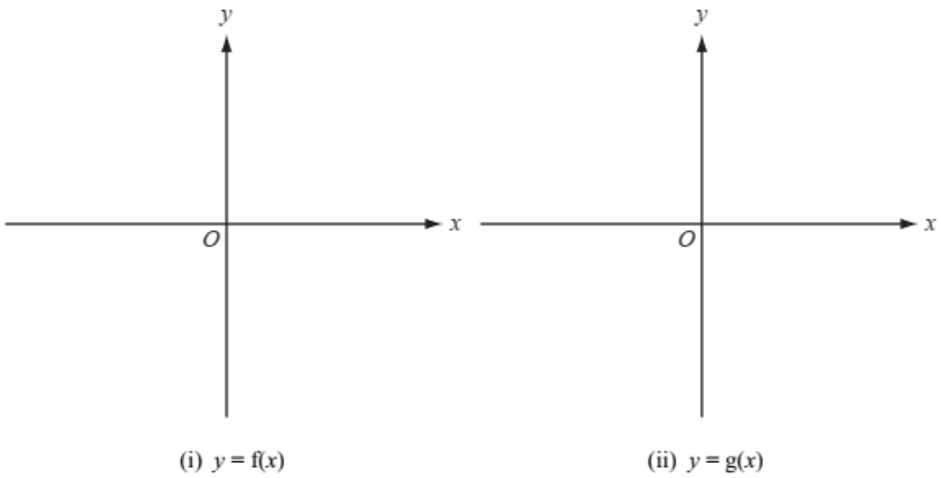
6. State which figures could be the graph of
(a) $y = x^3 + 1$ [1] (b) $y = x^2 - 3$ [1] (c) $y = 3^x$ [1] (d) $y = (x - 3)^2$ [1]



4024/11/O/N/14 Q20

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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]

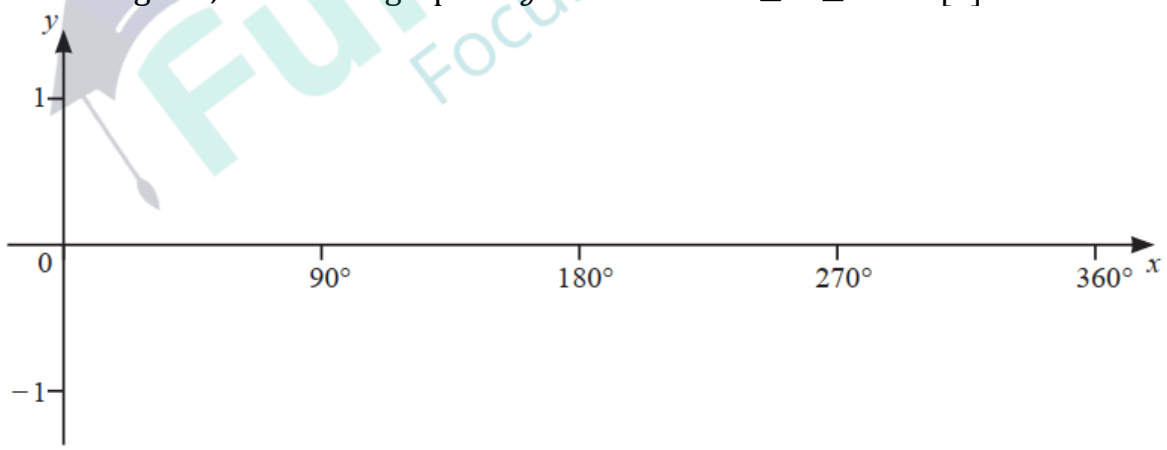
0580/04/M/J/09 Q10 (g)

8. Sketch the graph of each function.
(a) $y = x - 3$ [1] (b) $y = 1/x$ [2]



0580/22/F/M/20 Q10)

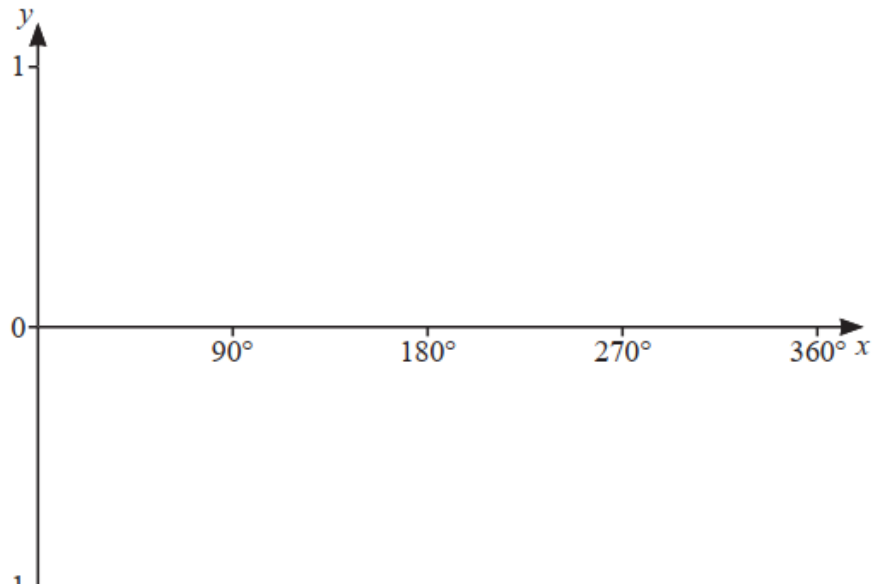
9. On the diagram, sketch the graph of $y = \cos x$ for $0° \leq x \leq 360°$ [2]



0580/22/F/M/20 Q19)

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

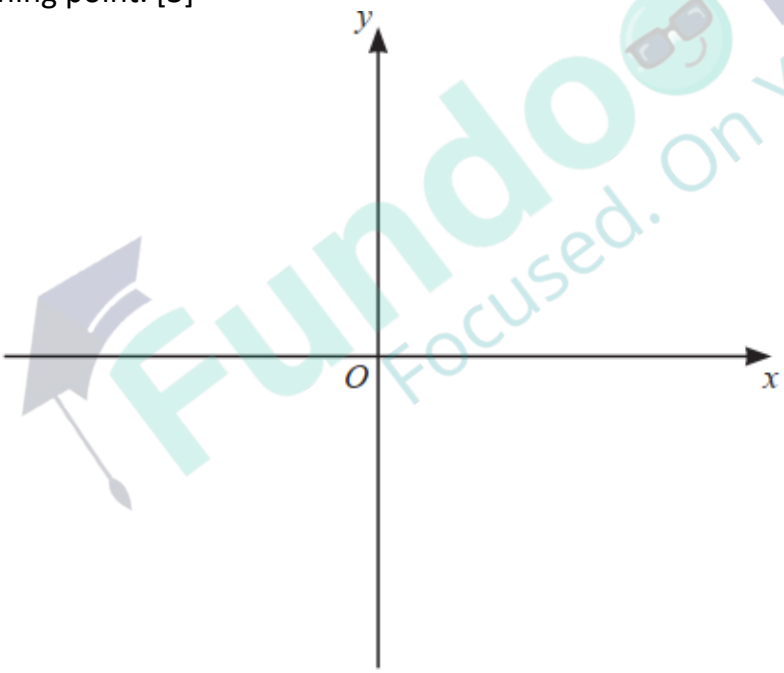


(b) Describe fully the symmetry of the graph of $y = \sin x$ for $0° \leq x \leq 360°$ [2]

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]



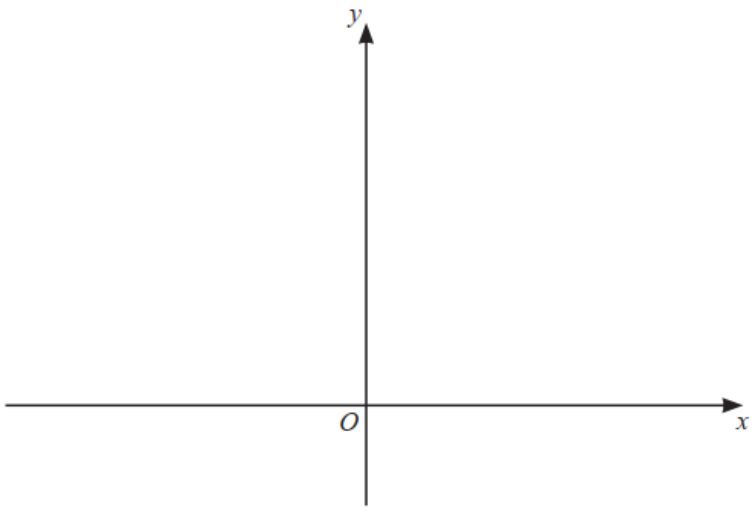
0580/41/M/J/20 Q8 (c)

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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.

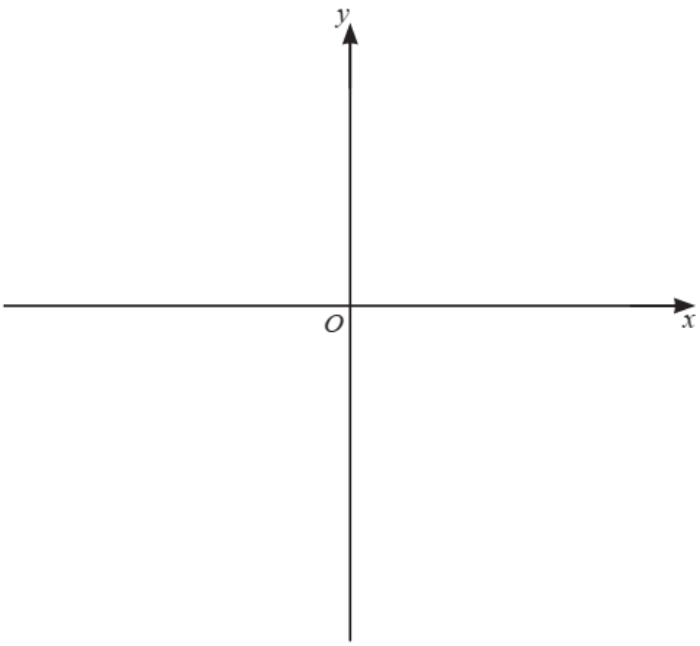
Find the length of AB. [7]

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

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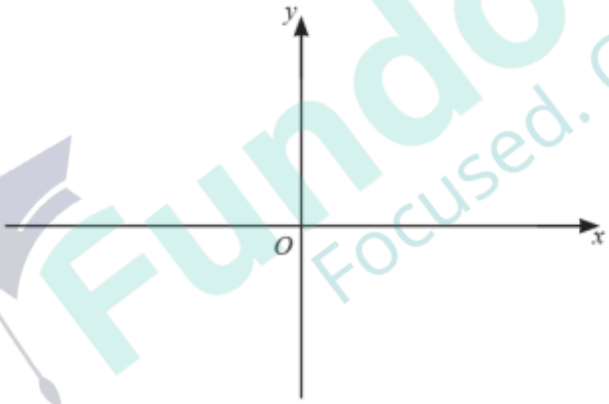
13. On the diagram, sketch the graph of $y = (x + 1)(x - 3)^2$
Label the values where the graph meets the x-axis and the y-axis.



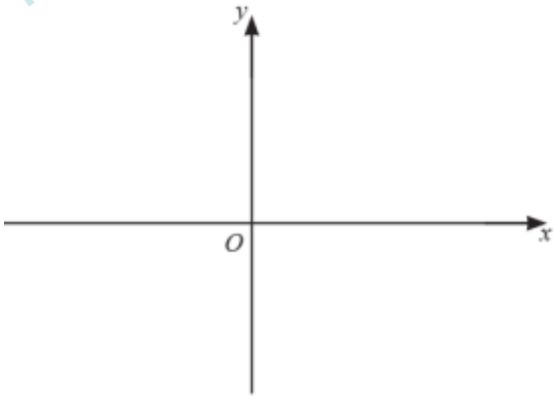
[4]

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]



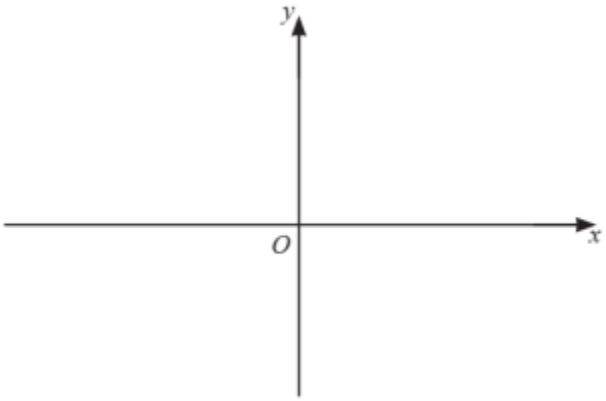
0580/22/F/M/21 Q21)

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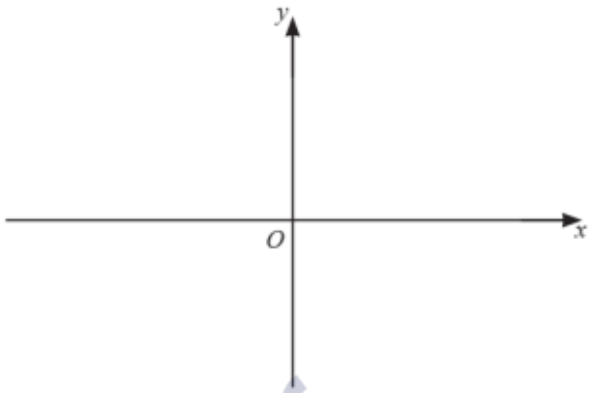
15. On the axes, sketch the graph of each of these functions.



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



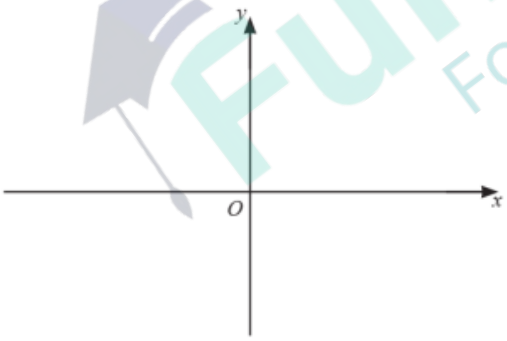
(b) $y = 2^{-x}$ [2]



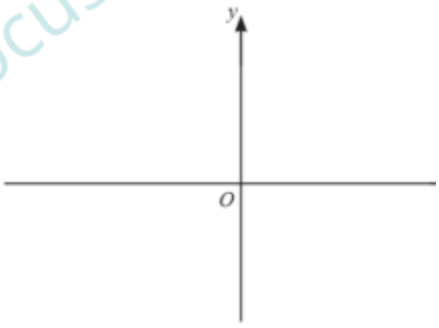
0580/23/M/J/21 Q24)

16. Sketch the following graphs.
On each sketch, indicate any intercepts with the axes.

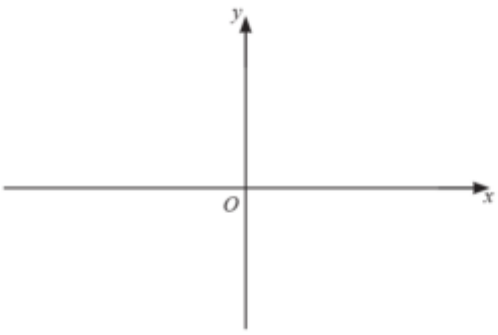
(i) $3x - 4y = 12$ [2]



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



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



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

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

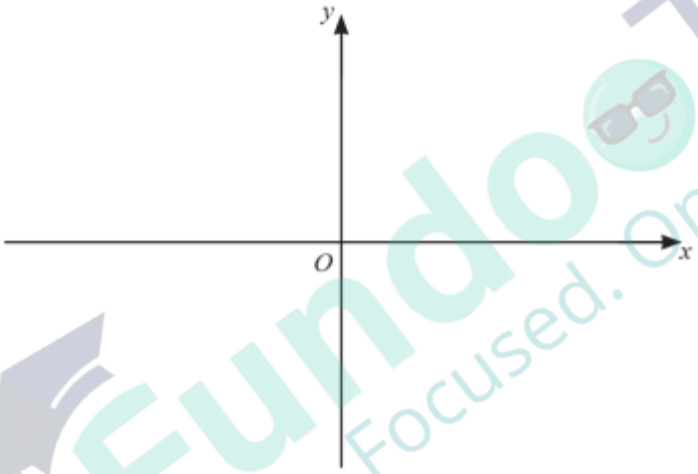


(a) Find the value of b. [2]

(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]



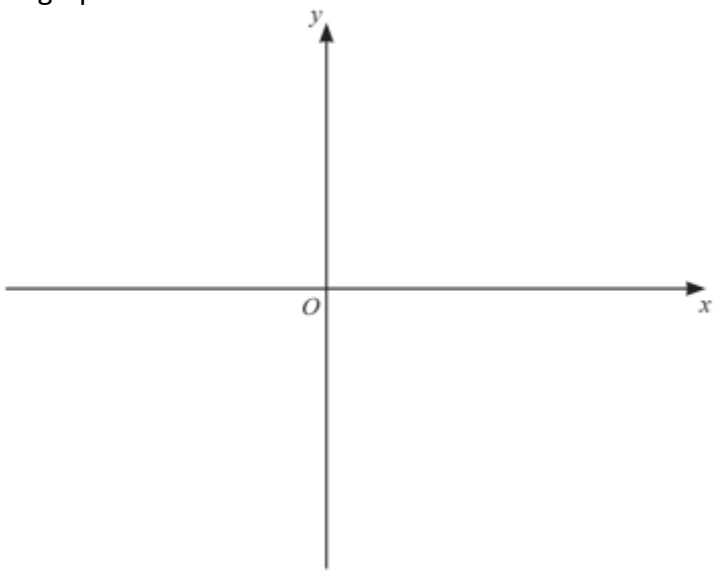
0580/42/F/M/22 Q12(b)

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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]

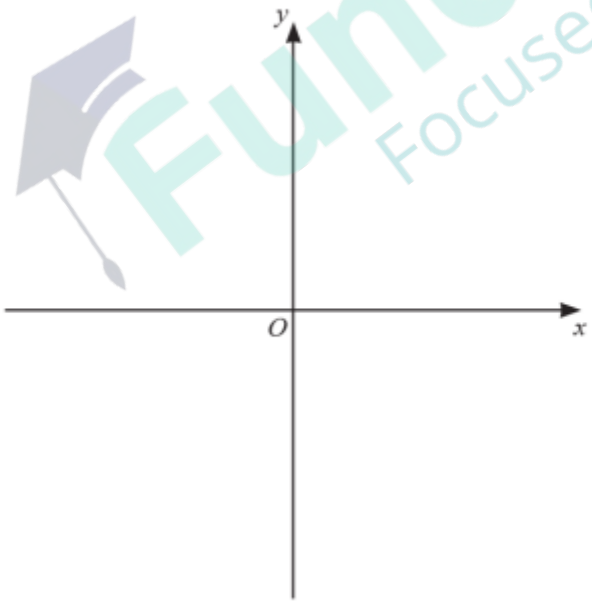
(ii) On the axes, sketch the graph of $y = x^3 - 4x^2 + 4x$, indicating the values where the graph meets the axes.



[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)

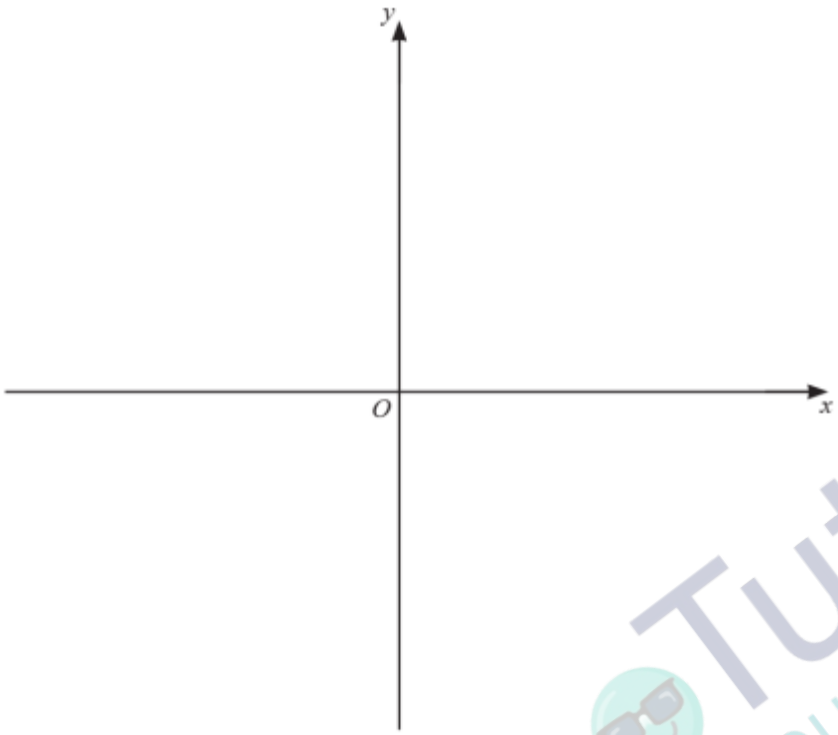
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21. $f(x) = x(x-1)(x-2)$

(a) Find the coordinates of the points where the graph of $y = \mathrm{f}(x)$ crosses the x-axis.[2]

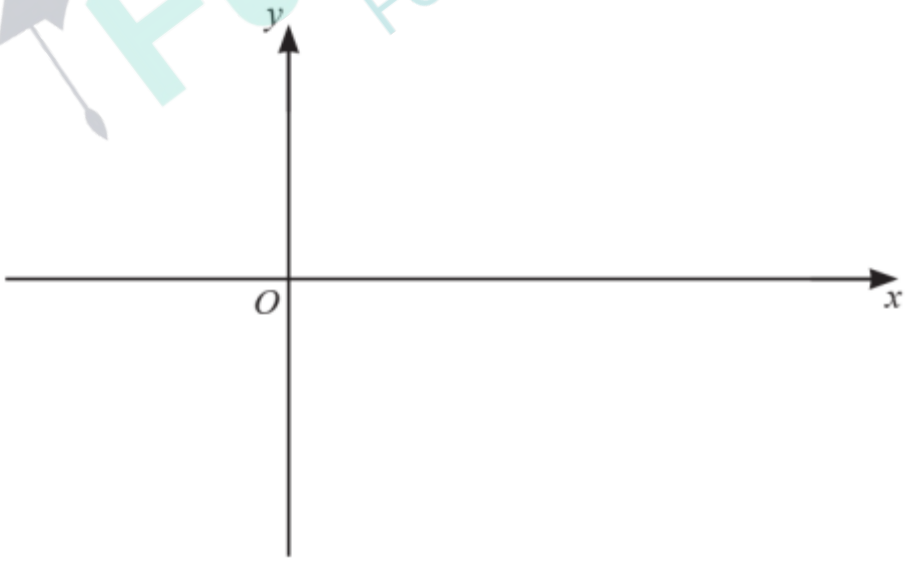
(b) Show that $\mathrm{f}(x) = x^3 - 3x^2 + 2x$. [2]

(c) Sketch the graph of $y = \mathrm{f}(x)$. [2]



0580/43/O/N/21 Q9)

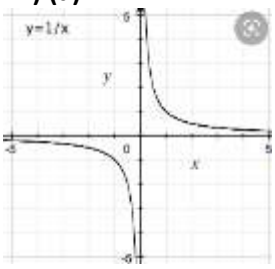
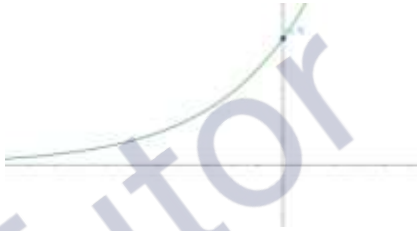
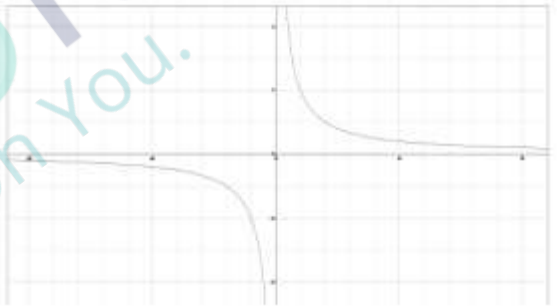
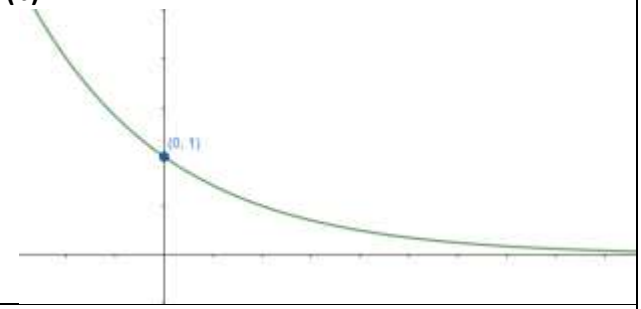
22. The graph of a cubic function has two turning points. When $x < 0$ and when $x > 4$ the gradient of the graph is positive. When $0 < x < 4$ the gradient of the graph is negative. The graph passes through the origin. Sketch the graph.



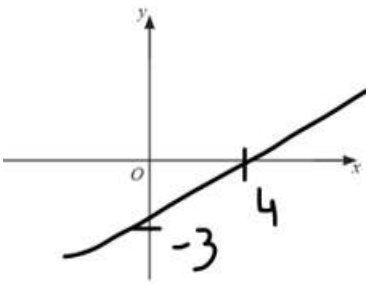
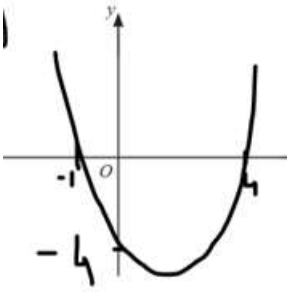
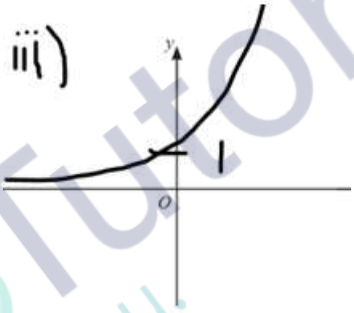
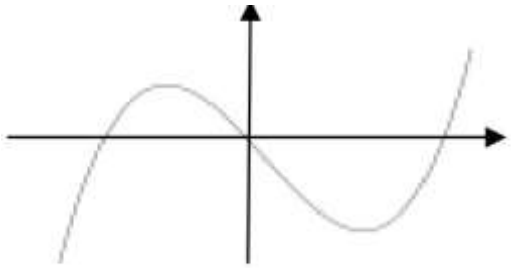
0580/21/O/N/22 Q21)

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Answers

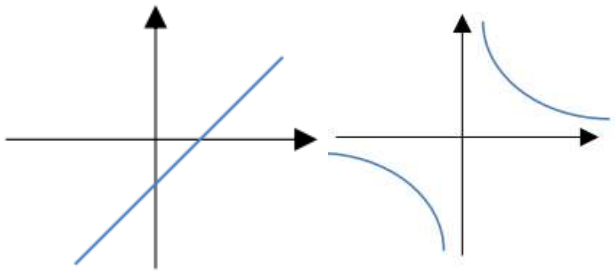
1) (a)Fig 6 (b) Fig 4 (c) Fig 2	**13)** positive cubic shape and max on the y-axis or to the right of y-axis with one root at (–1, 0) and turning point at (3, 0) and y-intercept at (0, 9) all labelled
2) (a)3 (b)2 (c)1	**14) (a)**  **(b)** 
3) A, C, D	**15) (a)**  **(b)** 
4) A, F, D	**16) (i)**

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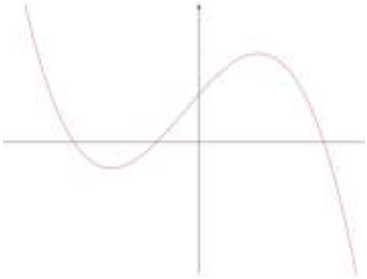
	 **(ii)**  **(iii)** 
5) (a)F (b)A (c)E	**17)** (a)5 (b)(3,0)
6) (a)F (b)C (c)B (d)E	**18)** 
7) (i) Straight line with positive gradient and (ii) U-shape Parabola ,vertex on positive y-axis	**19)** (a)(i) 2 (ii) 

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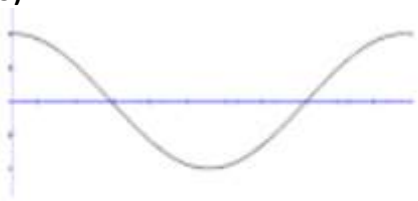
8)



20) Correct sketch of negative cubic crossing the *x*-axis at –3, –1 and 3and crossing the *y*-axis at 9

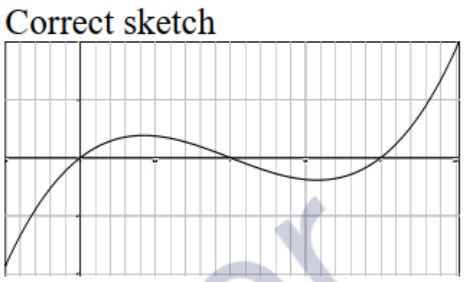


9)

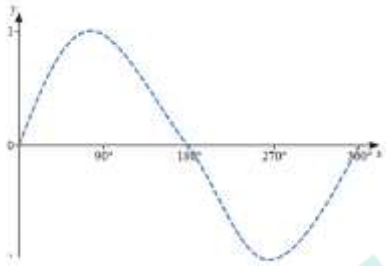


21) (a) (0,0), (1,0), (2,0)

(c)



10) (i)



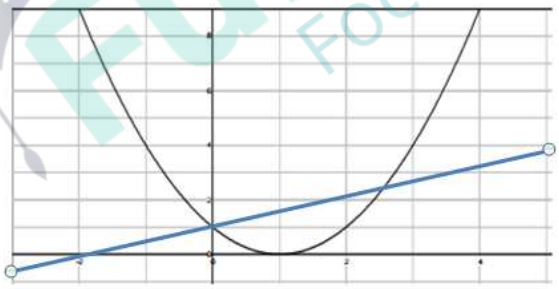
(ii) Rotational [symmetry] order 2 [centre] (180, 0)

22)



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 qadrant

12) (a) & (b)



(c) 2.8[0] or 2.795

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