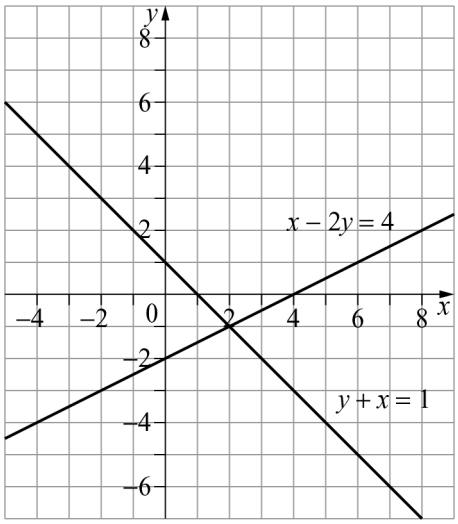
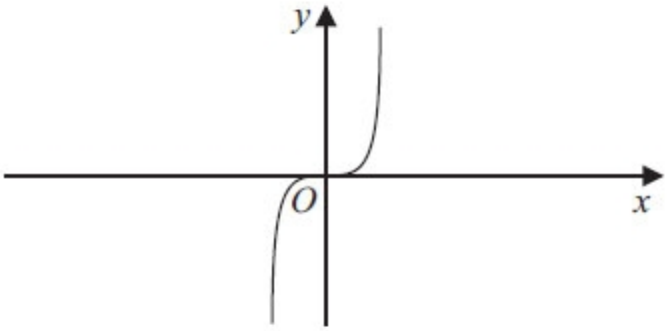
Foundation tier unit 20 check in test

Non-calculator

Q1. Use the graph to solve the simultaneous equations $x - 2y = 4$ and $y + x = 1$.



Q2. Here is a sketch graph.

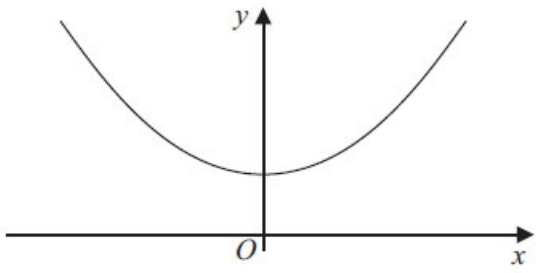


Which of these graphs does the sketch show?

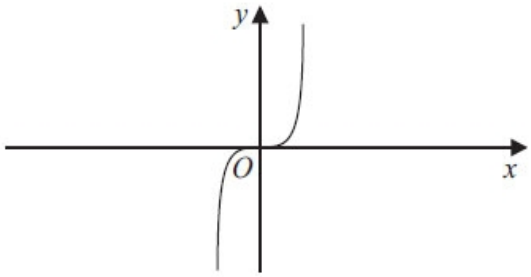
A $y = x^3$ B $y = x^2 + 4$ C $y = \frac{1}{x}$ D $y = 2^x$

Q3. Here are four sketch graphs.

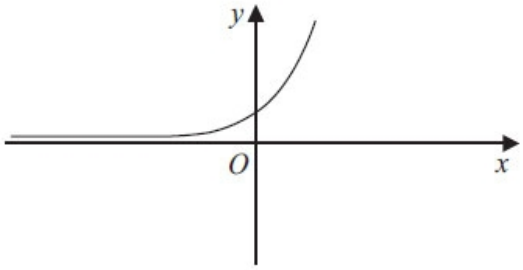
Which of these sketches is the graph of $y = \frac{1}{x}$?



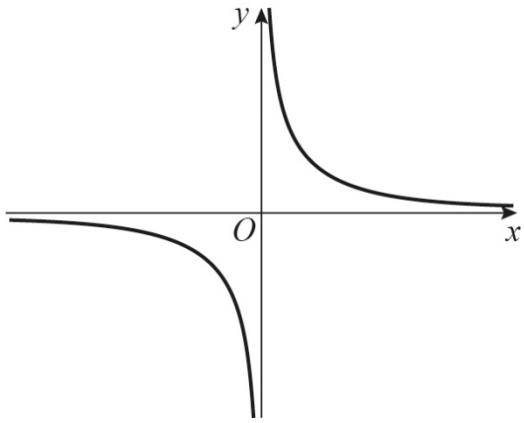
A



B



C



D

Q4. What is the gradient of a graph with equation $6x + 4y = 24$?

Q5. Make m the subject of the formula $6m^2 = k$

Q6. Point A has coordinates (3, 13) and point B has coordinates (8, 28).

Find the equation of the straight line that passes through points A and B.

Q7. Solve the simultaneous equations

$4x + y = 25$

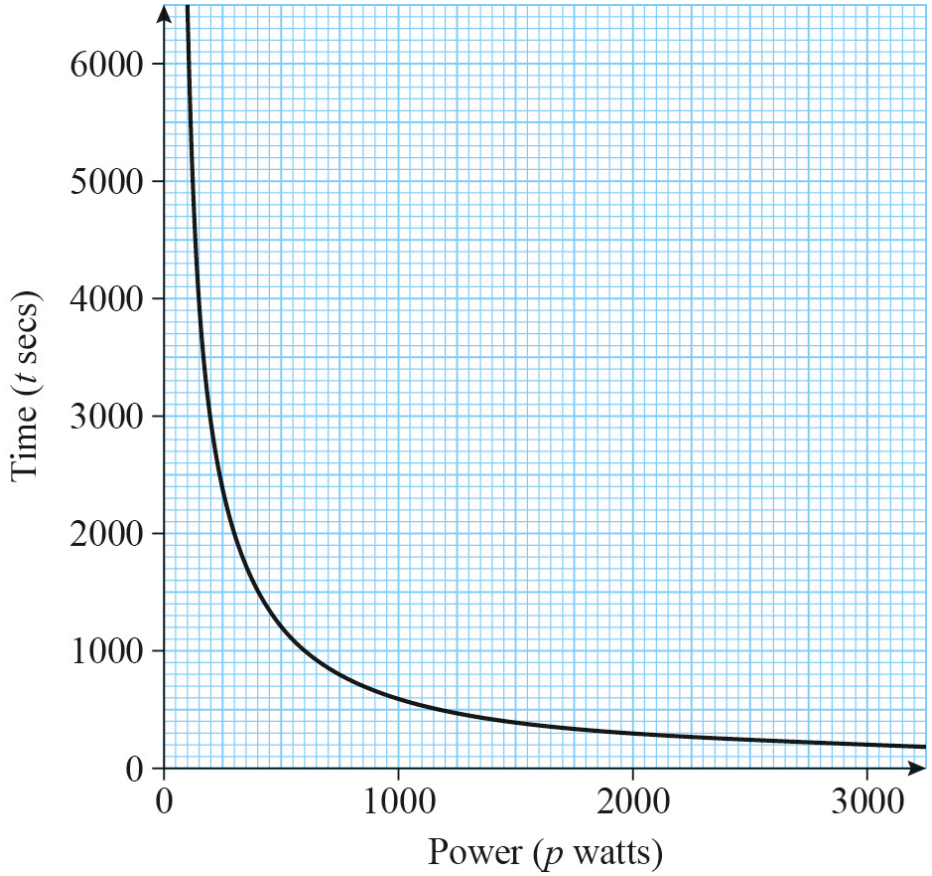
$x - 3y = 16$

Q8. A cinema sells adult tickets and child tickets.

The total cost of 3 adult tickets and 1 child ticket is £30
The total cost of 1 adult ticket and 3 child tickets is £22

Work out the cost of an adult ticket and the cost of a child ticket.

Q9. The time taken, t (in seconds), to boil water in a kettle is inversely proportional to the power, p (in watts), of the kettle.
The graph shows the relationship between t and p.



Find p when $t = 400$.

Q10. Show that $(n - 1)^2 + n^2 + (n + 1)^2 = 3n^2 + 2$

Topics listed in objectives

- Know the difference between an equation and an identity and use and understand the ≠ symbol;
- Change the subject of a formula involving the use of square roots and squares;
- Answer 'show that' questions using consecutive integers (n, $n + 1$), squares a^2, b^2, even numbers $2n$, and odd numbers $2n + 1$;
- Solve problems involving inverse proportion using graphs, and read values from graphs;
- Find the equation of the line through two given points;
- Recognise, sketch and interpret graphs of simple cubic functions;
- Recognise, sketch and interpret graphs of the reciprocal function $y = \frac{1}{x}$ with $x \neq 0$;
- Use graphical representations of inverse proportion to solve problems in context;
- Identify and interpret the gradient from an equation $ax + by = c$;
- Write simultaneous equations to represent a situation;
- Solve simultaneous equations (linear/linear) algebraically and graphically;
- Solve simultaneous equations representing a real-life situation, graphically and algebraically, and interpret the solution in the context of the problem;

Answers

Q1. $x = 2, y = -1$

Q2. A

Q3. D

Q4. –1.5

Q5. $m = \sqrt{\frac{k}{6}}$

Q6. $y = 3x + 4$

Q7. $x = 7, y = -3$

Q8. adult ticket £8.50, child ticket £4.50

Q9. $p = 1500$

Q10. Expand left-hand side to $n^2 - 2n + 1 + n^2 + n^2 + 2n + 1$, and collect like terms