13 y is directly proportional to x.

$y = 24$ when $x = 1.5$

Work out the value of y when $x = 5$

PK13A

$y =$ .....

(Total for Question 13 is 3 marks)

14 (a) Write $\frac{1}{16}$ in the form 4^n where n is an integer.

PK14A

.....

(1)

(b) Work out the value of $8^{\frac{5}{3}} - 9^{\frac{3}{2}}$

.....

(3)

(Total for Question 14 is 4 marks)

20 h is inversely proportional to p

p is directly proportional to $\sqrt{t}$

Given that $h = 10$ and $t = 144$ when $p = 6$
find a formula for h in terms of t

KX20A

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.....

(Total for Question 20 is 4 marks)

16 y is directly proportional to $\sqrt[3]{x}$

$y = 1\frac{1}{6}$ when $x = 8$

Find the value of y when $x = 64$

BK16A

(Total for Question 16 is 3 marks)

17 n is an integer.

Prove algebraically that the sum of $\frac{1}{2}n(n + 1)$ and $\frac{1}{2}(n + 1)(n + 2)$ is always a square number.

BK17A

(Total for Question 17 is 2 marks)

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PG5A

5 A car factory is going to make four different car models **A**, **B**, **C** and **D**.

80 people are asked which of the four models they would be most likely to buy.

The table shows information about the results.

Car model	Number of people
A	23
B	15
C	30
D	12

The factory is going to make 40 000 cars next year.

Work out how many model **B** cars the factory should make next year.

.....

(Total for Question 5 is 2 marks)

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13 p is inversely proportional to t

Complete the table of values.

PG13A

t	100	25		2
p	1		5	

(Total for Question 13 is 3 marks)

12 (a) Find the value of $81^{-\frac{1}{2}}$

BN12A

.....

(2)

(b) Find the value of $\left(\frac{64}{125}\right)^{\frac{2}{3}}$

.....

(2)

(Total for Question 12 is 4 marks)

13 The table shows a set of values for x and y.

BN13A

x	1	2	3	4
y	9	$2\frac{1}{4}$	1	$\frac{9}{16}$

y is inversely proportional to the square of x.

(a) Find an equation for y in terms of x.

.....

(2)

(b) Find the positive value of x when $y = 16$

.....

(2)

(Total for Question 13 is 4 marks)

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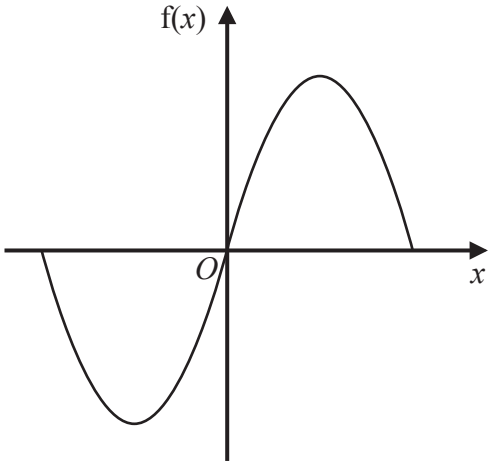
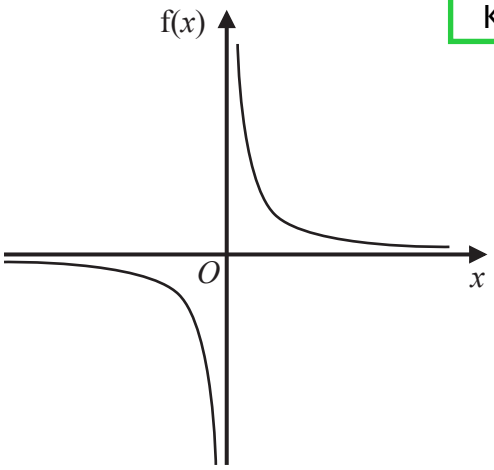
17 Here are four graphs.

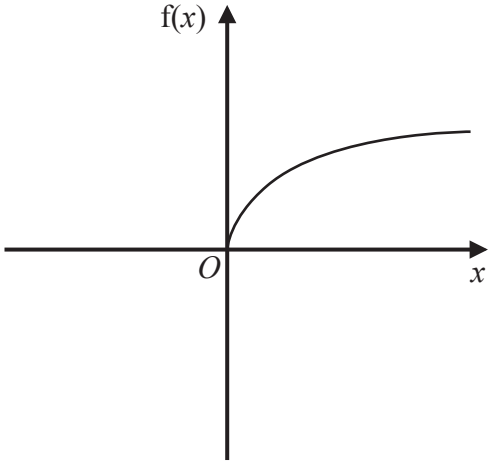
Graph A



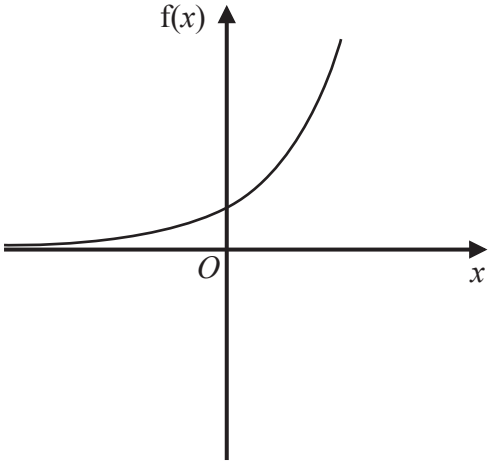
Graph B



Graph C



Graph D



The graphs represent four different types of function f.

Match each description of the function in the table to the letter of its graph.

Description of function	Graph
f(x) is inversely proportional to x	
f(x) is a trigonometrical function	
f(x) is an exponential function	
f(x) is directly proportional to $\sqrt{x}$	

(Total for Question 17 is 2 marks)

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BM2A

(Total for Question 2 is 3 marks)

3

BM3A

(Total for Question 3 is 3 marks)

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PM4A

4 It takes 14 hours for 5 identical pumps to fill a water tank.

How many hours would it take 4 of these pumps to fill another water tank of the same size?

..... hours

(Total for Question 4 is 2 marks)

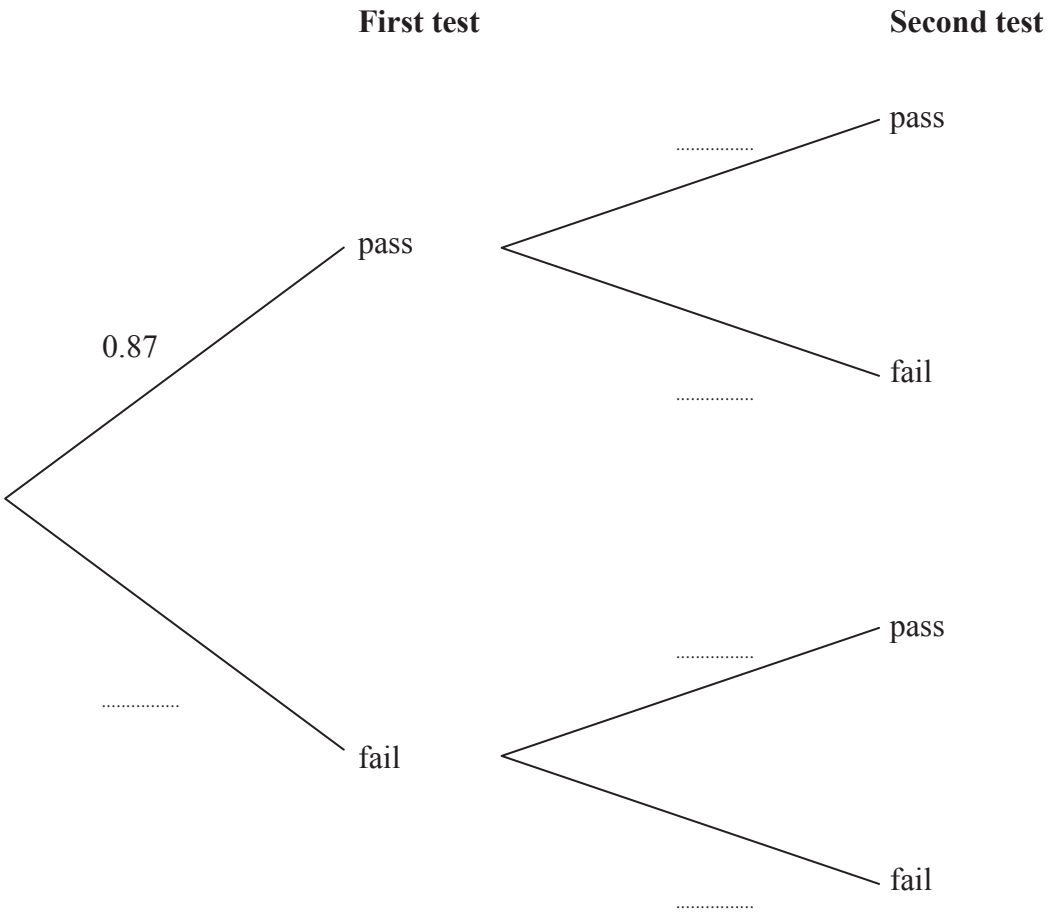
PP10A

10 Shakir has to complete two tests.
He can either pass or fail each test.

The probability that he will pass the first test is 0.87

If he passes the first test the probability he will pass the second test is 0.94
If he fails the first test the probability he will pass the second test is 0.73

(a) Complete the probability tree diagram for this information.



(2)

(b) Work out the probability that Shakir passes at least one of the tests.

.....

(3)

(Total for Question 10 is 5 marks)

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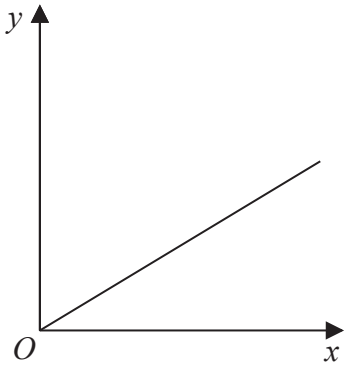
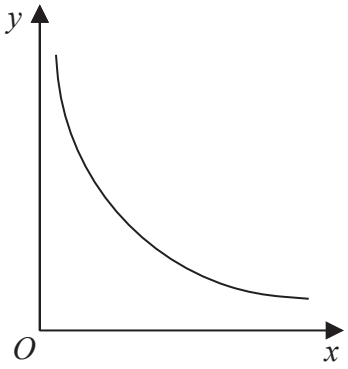
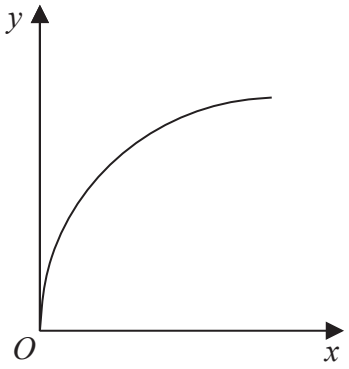
Graph **A**



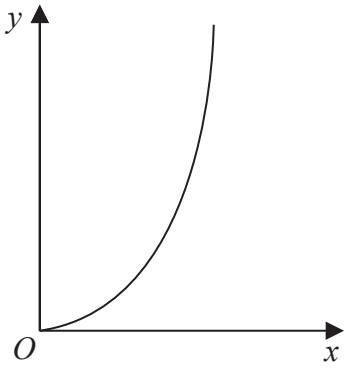
Graph **B**



Graph **C**



Graph **D**



PP11A

The graphs of y against x represent four different types of proportionality.

Match each type of proportionality in the table to the correct graph.

Type of proportionality	Graph
$y \propto x^2$	
$y \propto x$	
$y \propto \frac{1}{x}$	
$y \propto \sqrt{x}$	

(Total for Question 11 is 2 marks)

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13 Prove algebraically that $0.\dot{0}7\dot{2}\dot{3}$ can be written as $\frac{241}{3330}$

PP13A

(Total for Question 13 is 3 marks)

14 y is proportional to x^2
$y = 3$ when $x = 0.5$

x is inversely proportional to w
$x = 2$ when $w = 0.2$

Find the value of y when $w = 2$

PP14A

$y =$ .....

(Total for Question 14 is 5 marks)

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13 The number of animals in a population at the start of year t is P_t
The number of animals at the start of year 1 is 400

BG13A

Given that

$$P_{t+1} = 1.01P_t$$

work out the number of animals at the start of year 3

.....

(Total for Question 13 is 2 marks)

14 y is inversely proportional to x^3

$y = 44$ when $x = a$

Show that $y = 5.5$ when $x = 2a$

BG14A

(Total for Question 14 is 3 marks)

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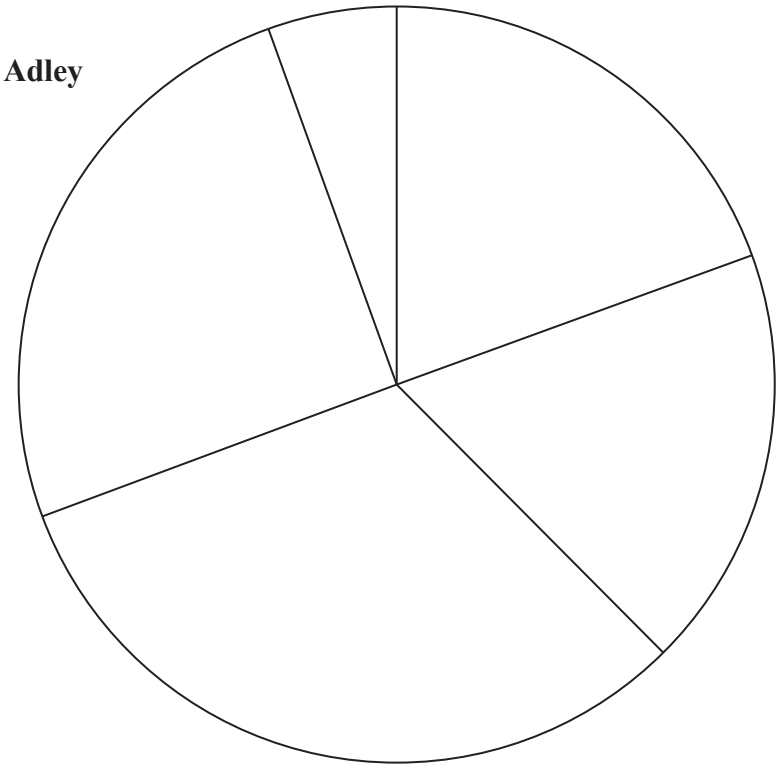
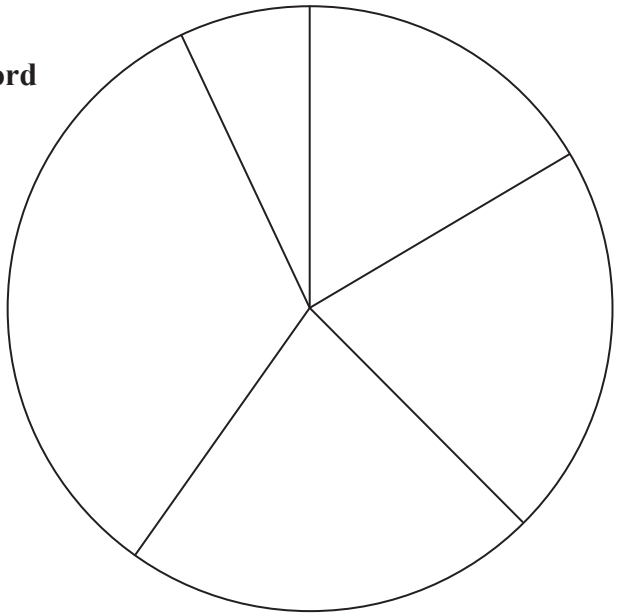
BL11A

Adley



Bridford



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(Total for Question 11 is 3 marks)

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