

GCSE (9 – 1) Mathematics
J560/04 Paper 4 (Higher tier)

Question Set 3

1 (a)

Bob makes dry concrete by mixing cement, sand and stone in the ratio 1 : 2 : 3 by weight. He buys the cement, sand and stone in bags as shown in this table.

	Weight of bag (kg)	Cost per bag (£)
Cement	25	5.50
Sand	20	2.00
Stone	15	3.90

He packs the dry concrete into 30 kg bags.

Bob buys just enough cement, sand and stone to make 50 bags of dry concrete.

(a) Show that Bob buys 500 kg of sand.

[3]

(b)

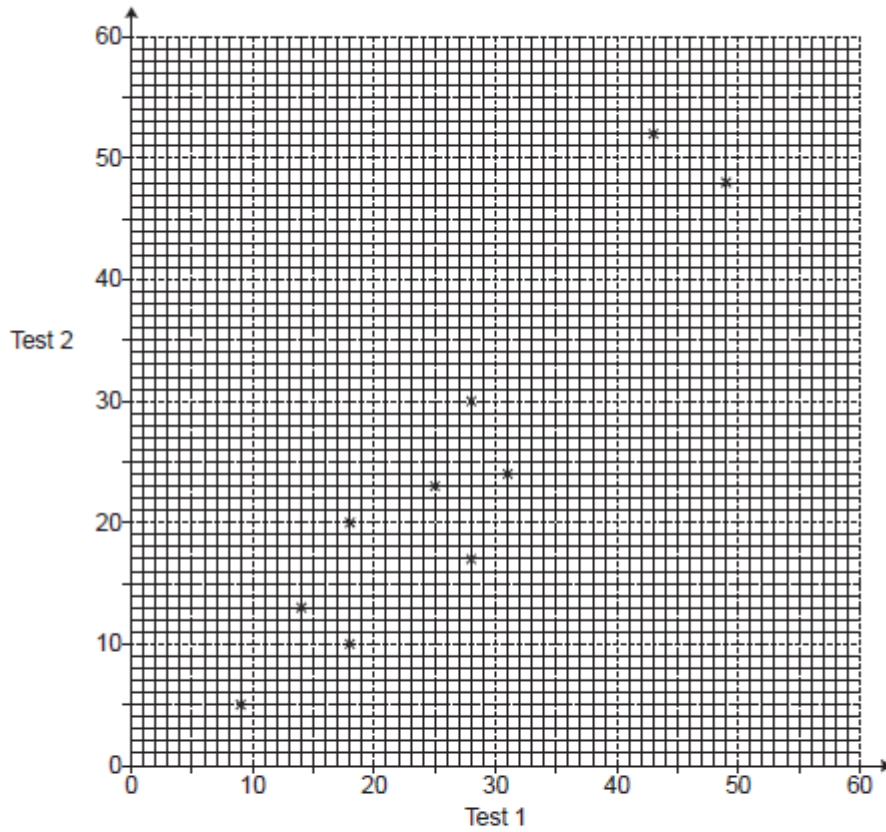
Bob sells the 50 bags of dry concrete for a total of £396.

Calculate Bob's percentage profit.

(b) % [5]

2 (a)

12 students take two tests.
Each test is out of 60.
The scatter diagram shows the results for 10 of the students.



(a) The table shows the results for the other 2 students.

Test 1	36	38
Test 2	44	41

Plot these results on the scatter diagram.

[1]

b)

Describe the type of correlation shown in the scatter diagram.

(b) [1]

(c) (i)

Draw a line of best fit on the scatter diagram.

[1]

- i i)** Another student was absent for Test 2.
The student scored 40 marks on Test 1.

Use your line of best fit to estimate a result for this student on Test 2.

(c)(ii) [1]

- (d)** Work out the percentage of **the 12 students** whose result on Test 1 is **lower** than their result on Test 2.

(d) % [4]

3 The diagrams show the price paid by two groups of people visiting a funfair.

5 adults	£	
4 children	£	
Total £		78

3 adults	£	
6 children	£	
Total £		63

Assume each adult pays the same price and each child pays the same price.

Find the price for an adult and the price for a child.

Adult price = £

Child price = £

[5]

4 (a)

The value of a house, £ H , is given by the formula

$$H = 165\,000 \times 1.03^t$$

where t is the number of years after 1st January 2010.

(a) Write down the value of the house on 1st January 2010.

(a) £ [1]

(b)

Write down the annual percentage increase in the value of the house.

(b) % [1]

(c)

Show that the value of the house is over £200000 on 1st January 2017.

[2]

5 (a)

A transport lorry consists of a cab and a trailer.
The trailer has a volume of 90m^3 .
Alfie makes a model of this lorry using a scale of 1 : 72.

Work out the volume of the trailer in Alfie's model, giving your answer in cm^3 .

(a) cm^3 [3]

(b)

Alfie paints his model lorry.
He has eight colours available.

He decides to paint the cab in one colour and the trailer in a different colour.

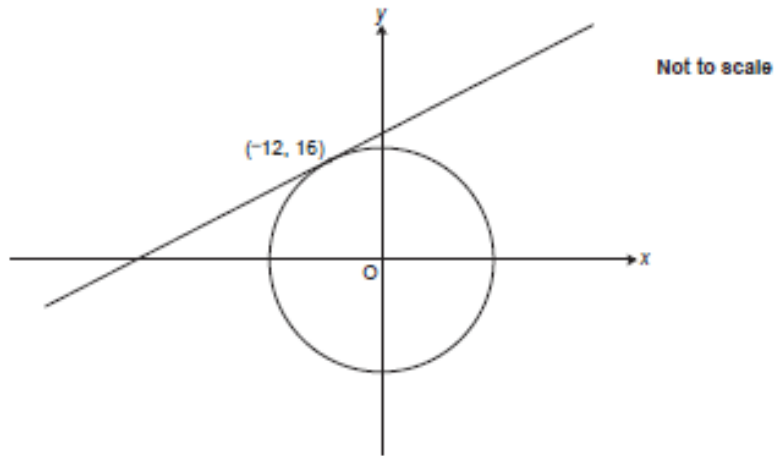
He then wants to paint his name on the trailer.
The name must be in a different colour to the trailer.

In how many different ways can Alfie paint his model lorry?

(b) [3]

6

The diagram shows a circle with centre $(0, 0)$ and a tangent at the point $(-12, 16)$.



The tangent crosses the y -axis at the point $(0, p)$.

Find the value of p .

$p = \dots\dots\dots$ [5]

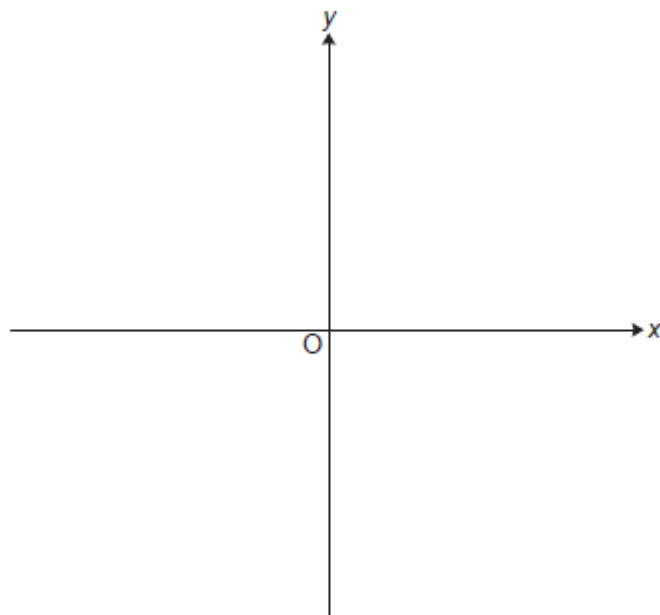
7

Show that $\frac{x+9}{x^2-1} + \frac{4}{x+1}$ can be written in the form $\frac{a}{x-1}$, where a is an integer.

[4]

8

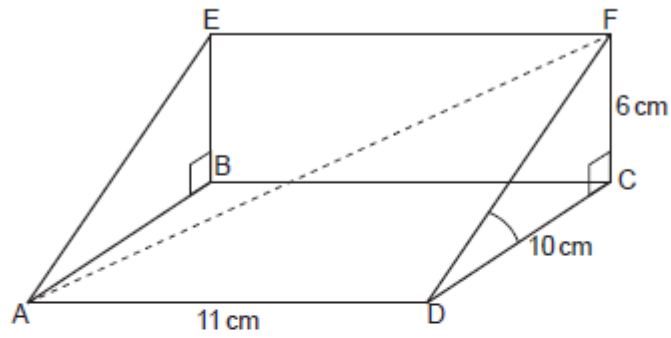
Sketch the graph of $y = 3^x$.
Give the value of the y -intercept.



[2]

9 (a)

The diagram shows a right-angled triangular prism ABCDEF.



Length $AD = 11$ cm, length $CD = 10$ cm and length $CF = 6$ cm.

(a) Calculate the volume of the prism.

(a) cm^3 [2]

(b) Use trigonometry to show that angle $FDC = 31^\circ$, correct to the nearest degree. [2]

(c) Calculate the exact length of AF .

(c) cm [4]

Total Marks for Question Set 3 : 50

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