Direct & Inverse Proportion

Question Paper

Course	Edexcel IGCSE Maths
Section	1. Numbers & the Number System
Topic	Direct & Inverse Proportion
Difficulty	Medium

Time allowed: 70

Score: /55

Percentage: /100

Question 1

Yesterday it took 5 cleaners $4\frac{1}{2}$ hours to clean all the rooms in a hotel.

There are only 3 cleaners to clean all the rooms in the hotel today.

Each cleaner is paid £8.20 for each hour or part of an hour they work.

How much will each cleaner be paid today?

[3 marks]

Question 2

p is inversely proportional to t.

When $t = 4, p = 12$

Find the value of p when $t = 6$

[3 marks]

Question 3

d is inversely proportional to c

When $c = 280,\ d = 25$

Find the value of d when $c = 350$

[3 marks]

Question 4

y is inversely proportional to x

When $x = 1.5$, $y = 36$

Find the value of y when $x = 6$

[3 marks]

Question 5a

At a depth of x metres, the temperature of the water in an ocean is $T°C$.
At depths below 900 metres, T is inversely proportional to x.

T is given by

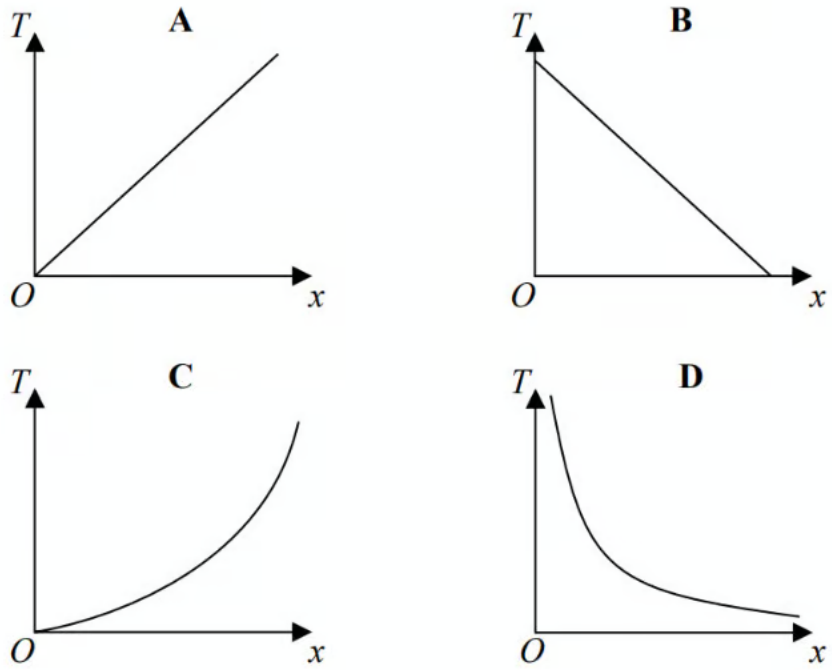
$$T = \frac{4500}{x}$$

Work out the difference in the temperature of the water at a depth of 1200 metres and the temperature of the water at a depth of 2500 metres.

[3 marks]

Question 5b

Here are four graphs.



One of the graphs could show that T is inversely proportional to x.

Write down the letter of this graph.

[1 mark]

Question 6a

T is directly proportional to the cube of r

$T = 21.76$ when $r = 4$

Find a formula for T in terms of r

[3 marks]

Question 6b

Work out the value of T when $r = 6$

[1 mark]

Question 7

y is inversely proportional to x.

Complete the table.

x	12	6	
y		4	8

[2 marks]

Question 8

The diagrams show the position of a tap when off and fully on.

The tap is fully on when the angle of turn is 180°

When fully on, water flows out of the tap at 14 litres per minute.
The rate at which water flows out is in direct proportion to the angle of turn.
The tap is turned 135°

The water flows into a tank with a capacity of 79.8 litres.

Will it take **less than** $7\frac{1}{2}$ minutes to fill the tank?

You **must** show your working.

[4 marks]

Question 9a

To complete a task in 15 days a company needs

4 people each working for 8 hours per day.

The company decides to have

5 people each working for 6 hours per day.

Assume that each person works at the same rate.

How many days will the task take to complete?
You **must** show your working.

[3 marks]

Question 9b

Comment on how the assumption affects your answer to part (a).

[1 mark]

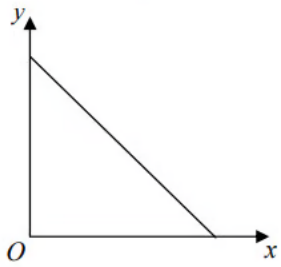
Question 10

y is directly proportional to x.

Which graph shows this?

Circle the correct letter.

A



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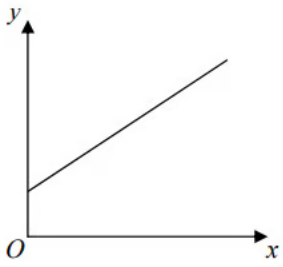

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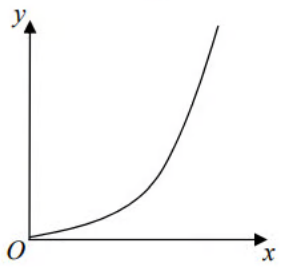

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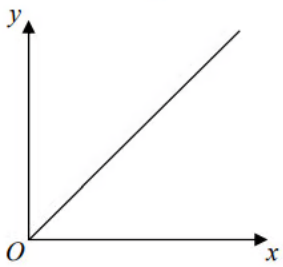

[1 mark]

Question 11

Carol makes birthday cards.
Each card takes the same amount of time to make.

She makes 3 cards in 48 minutes.
She has an order for 80 cards.

Can she complete this order in 3 days if she works 8 hours each day?
Show how you decide.

..... because

.....

[5 marks]

Question 12

y is inversely proportional to x.
$y = 0.04$ when $x = 80$.

Find the value of y when $x = 32$.

$y =$ .....

[3 marks]

Question 13

The table shows values of x and y.

x	4	16	36
y	6	3	2

Show that these values fit the relationship that y is inversely proportional to $\sqrt{x}$.

[2 marks]

Question 14a

Sam and two friends put letters in envelopes on Monday.
The three of them take two hours to put 600 letters in envelopes.

On Tuesday Sam has three friends helping.

Working at the same rate, how many letters should the **four** of them be able to put in envelopes in two hours?

[2 marks]

Question 14b

Working at the same rate, how much longer would it take **four** people to put 1000 letters in envelopes than it would take **five** people?

[4 marks]

Question 14c

Sam says

> It took two hours for three people to put 600 letters in envelopes.
> If I assume they work all day, then in one day three people will put 7200 letters in envelopes because $600 \times 12 = 7200$.

Why is Sam's assumption not reasonable?
What effect has Sam's assumption had on her answer?

[2 marks]

Question 15a

Donald swims 3 lengths of a swimming pool in 93 seconds.

i)
Use this information to show that he could swim 100 lengths in under 55 minutes.

[4]

ii)
What assumption did you make in part **(i)**?

[1]

[5 marks]

Question 15b

Donald tries to swim the 100 lengths in under 55 minutes.

Suggest one reason why he might not achieve this.

[1 mark]