MAIDEN ERLEGH
CHILTERN EDGE

Name: …………………………..

Y11 Foundation
Christmas Homework

- **If you need help with any questions, please use the Sparx Maths code to watch the support video.**
- **Answer ALL questions.**
- **Write your answers in the spaces provided.**
- **You must write down all the stages in your working.**

Topic List	Sparx Maths Code
Calculator Skills	**U926**
One Mark Questions	
Solving Equations	**U237**
Inequalities	**U968**
Trigonometry	**U370, U634**
Word Problems	**U274, U357, U721, U859**

Section 1- Calculator Skills

1 Find $\sqrt{1.44}$

....

(Total for Question 3 is 1 mark)

---

2 Find the value of $\sqrt{17.64}$

....

(Total for Question 2 is 1 mark)

---

3 (*a*) Find the value of $\sqrt{1.44 \times 3.61}$

....

(1)

(*b*) Find the value of $(3.54 - 0.96)^2 - 4.096$

....

(2)

(Total for Question 3 is 3 marks)

---

4 (a) Use your calculator to work out $\dfrac{43.2 + \sqrt{99.05}}{0.193}$

Write down all the digits on your calculator display.

....

(2)

(b) Write your answer to part (a) correct to 2 significant figures.

....

(1)

(Total for Question 4 is 3 marks)

---

5 Find the value of $\dfrac{5.27 + 3.5}{7.9 - 4.36}$

Give your answer as a decimal.
Write down all the figures on your calculator display.

....

(Total for Question 5 is 2 marks)

6 (*a*) Work out $\dfrac{4.36 + 2.8^3}{6.8 - 5.42}$

Give your answer as a decimal.
Write down all the digits on your calculator display.

....

(2)

(*b*) Give your answer to part (*a*) correct to 1 decimal place.

....

(1)

(Total for Question 6 is 3 marks)

7 Work out the value of $\dfrac{\sqrt{2.7} + 6.5}{4.8 - 1.06}$

Give your answer correct to 2 decimal places.

....

(Total for Question 7 is 3 marks)

8 Find the value of $\dfrac{\sqrt{13.4}-1.5}{(6.8+0.06)^2}$

Write down all the figures on your calculator display.

....

(Total for Question 8 is 2 marks)

9 (a) Use your calculator to work out the value of

$$\sqrt{\dfrac{51.2-37.38}{9.67+84.9}}$$

Write down all the digits on your calculator display.

....

(2)

(b) Write your answer to part (a) correct to 2 significant figures.

....

(1)

(Total for Question 9 is 3 marks)

10 Use your calculator to work out $\sqrt{\dfrac{\sin 25\boxed{?} + \sin 40}{\cos 25\boxed{?} - \cos 40}}$

(*a*) Write down all the figures on your calculator display.

....
(2)

(*b*) Write your answer to part (*a*) correct to 2 decimal places.

....
(1)

(Total for Question 10 is 3 marks)

11   (*a*)   Use your calculator to work out $\dfrac{29^2 - 4.6}{\sqrt{35 - 1.9^3}}$

Write down all the figures on your calculator display.

....
(2)

(*b*) Write your answer to part (*a*) correct to 4 significant figures.

....

Section 2- One mark Questions

a	Change 783 cm into metres.	
b	Change 5.2 kg into grams.	
c	Convert 3.2 km into metres	
d	Write 9200 mm in metres	
e	Convert 8350 g into kilogrammes	

a	Write down a multiple of 8 that is between 50 and 60.	
b	Write down the two multiples of 7 that are between 40 and 50.	
c	Write down any two factors of 18.	
d	List all the factors of 15	
e	Express 20 as a product of prime factors	

a	Simplify $2p \times 7q$	
b	Simplify $k \times k$	

c	Simplify $\dfrac{4h + 6h}{2}$	
d	Simplify $3r \times 5s \times 10t$	
e	Simplify $3m \times 2m$	

a	Write 5472 correct to the nearest 1000	
b	Write 257 correct to the nearest 100	
c	Write 7658 correct to the nearest 10	
d	Calculate 2 x 1530. Write your answer to nearest 1000	
e	Work out 3 x 420 Write your answer to the nearest 100	

a	Write the following numbers in order of size. Start with the smallest number. 0.6 0.04 0.39 0.172	
b	Write the following numbers in order of size. Start with the smallest number. 0.3 0.03 0.303 0.33	
c	Write the following numbers in order of size. Start with the smallest number. 0.1 3/10 27/100 0.25	
d	Which is biggest 0.4 or 37/100?	
e	Which is biggest 231/1000 or 0.2?	

a	Which of these fractions is **not** equivalent to $\frac{1}{3}$? $\frac{11}{33}$ $\frac{15}{45}$ $\frac{3}{30}$ $\frac{9}{27}$	
b	Which of these fractions is **not** equivalent to $\frac{1}{5}$? $\frac{7}{35}$ $\frac{9}{45}$ $\frac{20}{100}$ $\frac{15}{55}$	
c	Which **two** of these fractions **are** equivalent to $\frac{1}{4}$? $\frac{14}{44}$ $\frac{8}{32}$ $\frac{17}{68}$ $\frac{4}{14}$	
d	Which fraction is biggest? $\frac{3}{5}$ $\frac{13}{20}$	
e	Which fraction is biggest? $\frac{5}{8}$ $\frac{13}{24}$	

a	Here are 4-digits 3 8 5 2 Use these digits to write down the largest possible 4-digit number.	

b	Use 3 of the digits in (a) to write down the smallest possible 3-digit number.	
c	Use 3 of the digits in (a) to write down the smallest possible 3-digit even number.	
d	Use 3 of the digits in (a) to write down the largest possible 3-digit number that rounds to 400.	
e	Use 3 of the digits in (a) to write down any 3-digit number that divides by 3.	

Section 3 – Solving Equations

(*a*)   Solve $t + t + t = 12$

$t =$ ....
(1)

(*b*)   Solve $x - 2 = 6$

$x =$ ....
(1)

(*c*)   Solve $6w + 2 = 20$

$w =$ ....
(2)

(Total for Question 1 is 4 marks)

2 Solve $3(m - 4) = 21$

$m =$ ....

(Total for Question 2 is 2 marks)

3 Solve $7(f - 5) = 28$

$f =$ ....

(Total for Question 3 is 1 mark)

4 Solve $\dfrac{y}{4} = 10.5$

$y =$ ....

(Total for Question 4 is 1 mark)

5 Solve $4(x - 5) = 18$

$x =$ ....

(Total for Question 3 is 2 marks)

Section 4 – Inequalities

(*a*) On the number line, show the inequality $x < 4$

$$\begin{array}{cccccccccccc} & -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \end{array} \quad x$$
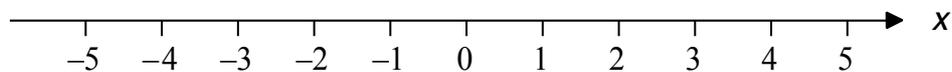
(2)

$3 < y \leq 7$ where y is an integer.

(*b*) Write down all the possible values of y.

....

(2)

(*c*) Solve $3x + 5 \geq x + 17$

....

(3)

(Total for Question 1 is 7 marks)

2 $-3 < t \leq 2$

t is an integer.

Write down all the possible values of t.

....

(Total for Question 2 is 2 marks)

3   (*a*)   Solve $14n > 11n + 6$

....
(2)

(*b*)   On the number line below, show the set of values of *x* for which $-2 < x + 3 \leqslant 4$

(3)
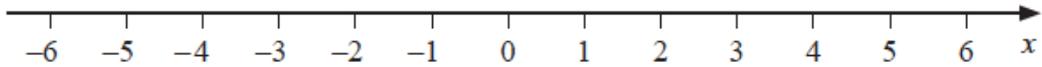
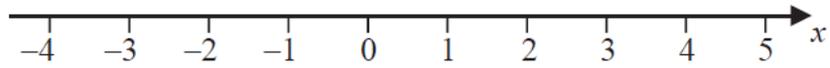**(Total for Question 3 is 5 marks)**

4   Here is a number line.
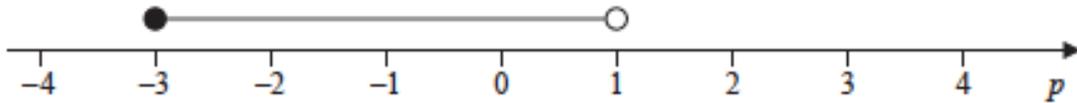
Write down the inequality shown on the number line.

13

....

(Total for Question 4 is 2 marks)

5   (*a*) Show the inequality $-2 \le x < 3$ on the number line below.

$$\xrightarrow{\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad} x$$

$$-4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5$$

(2)

(*b*) Solve the inequality $4y + 7 < 16$

....

(2)

(Total for Question 5 is 4 marks)

6 Solve $3(n-1) < 21$

....

(Total for Question 6 is 2 marks)

7 Here is a number line.
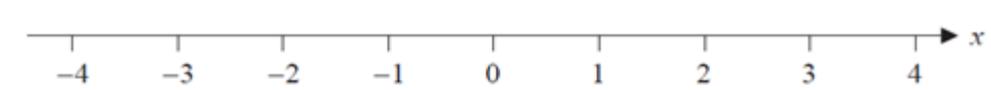
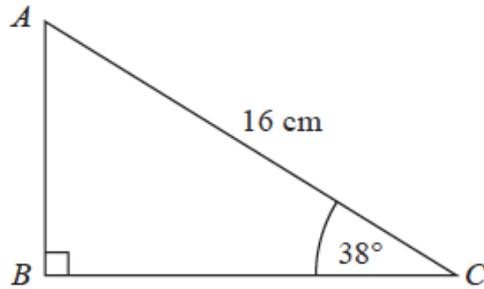(a) On this number line, show the inequality $-2 \leq x < 3$

(2)

(b) Solve $5n + 3 > 27$

....

(2)

(Total for Question 7 is 4 marks)

Section- 5 Trigonometry

1   *ABC* is a right-angled triangle.

Calculate the length of *AB*.
Give your answer correct to 2 decimal places.

....cm

(Total for Question 1 is 2 marks)

2 *ABC* is a right-angled triangle.
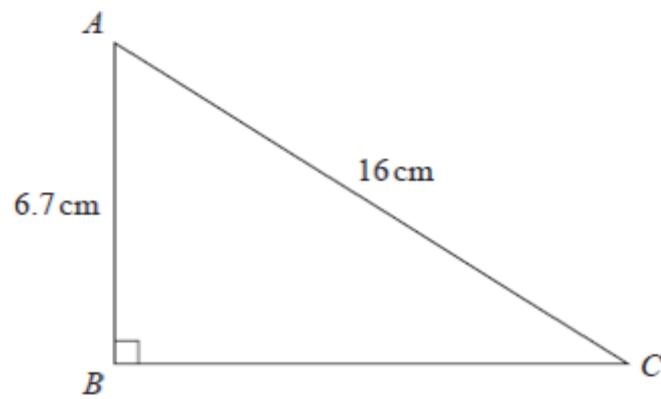
Calculate the length of *BC*.
Give your answer correct to 1 decimal place.

.... cm

(Total for Question 2 is 3 marks)

3   *ABC* is a right-angled triangle.
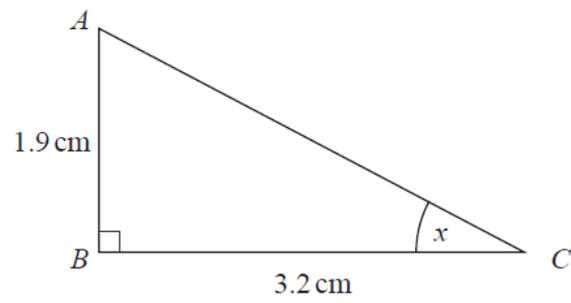
A figure shows a right-angled triangle with vertices A (top left), B (bottom left, right angle), and C (bottom right). Side AB = 1.9 cm, side BC = 3.2 cm, and the angle at C is marked x.

Work out the size of the angle marked *x*.
Give your answer correct to 1 decimal place.

.... °

(Total for Question 3 is 2 marks)

4 *ABC* is a right-angled triangle.
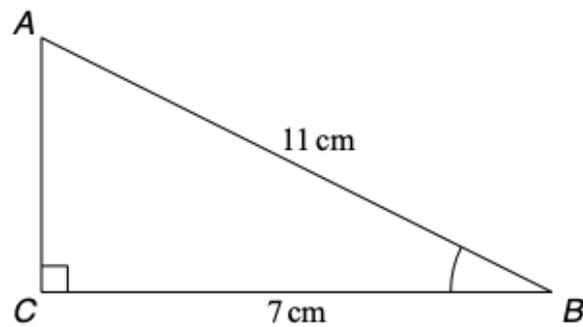
(*a*) Work out the size of angle *ABC*.
Give your answer correct to 1 decimal place.

.... °

(2)

The length of the side *AB* is reduced by 1 cm.

The length of the side *BC* is still 7 cm.
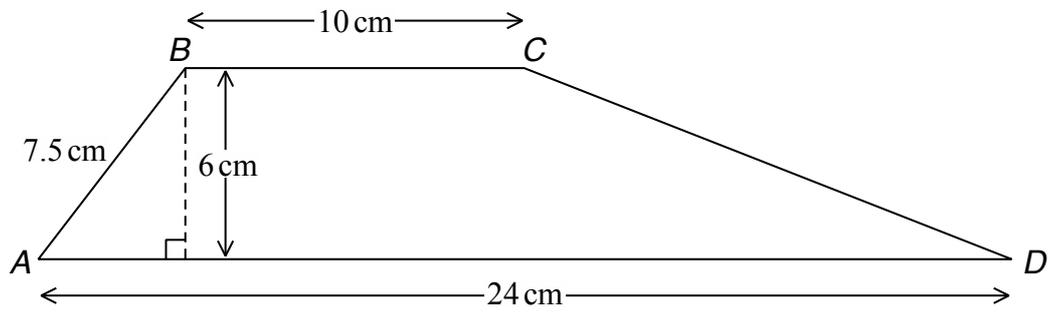Angle *ACB* is still 90°

(*b*) Will the value of cos *ABC* increase or decrease?
You must give a reason for your answer.

....

....

(1)

(Total for Question 4 is 3 marks)

5   *ABCD* is a trapezium.

Work out the size of angle *CDA*.
Give your answer correct to 1 decimal place.

6   *ABC* is a right-angled triangle.
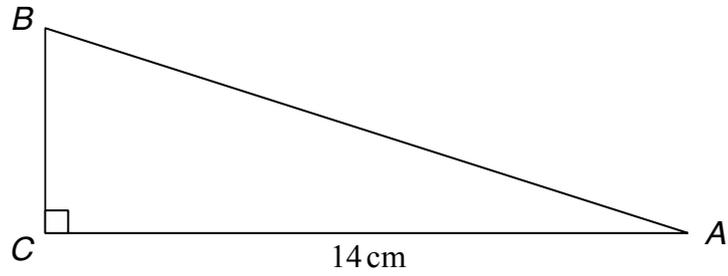
AC = 14 cm.
Angle *C* = 90°

   size of angle *B* : size of angle *A* = 3 : 2

Work out the length of *AB*.
Give your answer correct to 3 significant figures.

....cm

(Total for Question 6 is 4 marks)

7 *PQR* is a right-angled triangle.
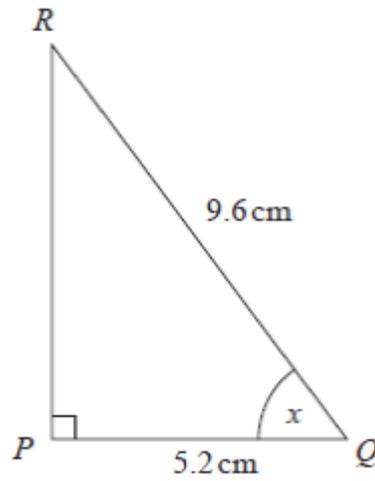
R

9.6 cm

x

P

5.2 cm

Q

Work out the size of the angle marked *x*.
Give your answer correct to 1 decimal place.

....°

(Total for Question 7 is 2 marks)

8   (*a*) Write down the exact value of cos30°

....
(1)

(*b*)
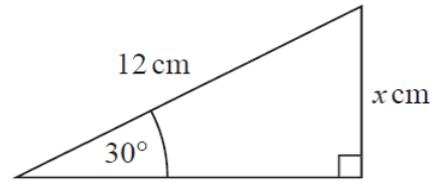
Given that sin30° = 0.5,
work out the value of *x*.

....
(2)

(Total for Question 8 is 3 marks)

Section 6- Word Problems

Joanne wants to buy a dishwasher.

The dishwasher costs £372.

Joanne will pay a deposit of £36.
She will then pay the rest of the cost in 4 equal monthly payments.

How much is each monthly payment?

£...

2 The table gives information about the prices of cinema tickets.

Cinema ticket	Price
adult ticket	£7.80
child ticket	£5.80
family ticket (for 4 people)	£24.30

Mr Edwards and his 3 children go to the cinema.

It is cheaper for Mr Edwards to buy 1 family ticket rather than 4 separate tickets.

(*a*) How much cheaper?

....

(3)

The film starts at 6.45 p.m.
The film lasts 102 minutes.

(*b*) What time does the film finish?

....

(2)

(Total for Question 2 is 5 marks)

3   There are 14 rows of seats in a cinema.
There are 15 seats in each row.

A film was shown in the cinema on Saturday.
Each ticket for the film cost £6.50

The tickets that were sold cost a total of £1274

How many tickets were **not** sold?

....

(Total for Question 3 is 3 marks)

4 You can use this rule to work out the total hire charge, in pounds (£), for hiring a 3D printer for a number of weeks.

Total hire charge (£) = number of weeks × 70 + 50

Mia wants to hire a 3D printer for 4 weeks.

(*a*) Work out the total hire charge.

£...

(2)

Zahir hires a 3D printer.
The total hire charge is £680

(*b*) For how many weeks does Zahir hire the 3D printer?

.... weeks

(2)

(Total for Question 4 is 4 marks)

5   Emma has 45 rabbits.

30 of the rabbits are male.
8 of the female rabbits have short hair.
12 of the rabbits with long hair are male.

(*a*) Use the information to complete the two-way table.

	Male	Female	Total
Long hair	12	7	19
Short hair	18	8	26
Total	30	15	45

(3)

One of Emma's rabbits is chosen at random.

(*b*) Write down the probability that this rabbit is a female with short hair.

....

(1)

(Total for Question 5 is 4 marks)

6   There are 40 students in a class.
Each student walks to school or cycles to school or gets the bus to school.

There are 22 girls in the class.
9 of the girls walk to school.
7 of the boys cycle to school.
6 of the 10 students who get the bus to school are boys.

Find the number of these students who walk to school.

....

(Total for Question 6 is 4 marks)

7   Mohsin, Yusuf and Luke are going to play a game.

At the end of the game, one of them will be in First place, one of them will be in Second place and one of them will be in Third place.

Use the table below to list all the possible outcomes of the game.

First place	Second place	Third place

(**Total for Question 7 is 2 marks**)

8   Davos is a cleaner.

The table shows information about the time it will take him to clean each of four rooms in a house.

Room	Time
Kitchen	2 hours
Sitting room	1 hour 40 minutes
Bedroom	$1\frac{1}{2}$ hours
Bathroom	45 minutes

Davos wants to clean all four rooms in one day.
He will have breaks for a total time of 75 minutes.

Davos is going to start cleaning at 9 a.m.

Will he finish cleaning by 4 p.m.?
You must show all your working.

(Total for Question 8 is 3 marks)

9   There are 800 students at a school.
Each student has either a school dinner or a packed lunch.

31% of the students have packed lunches.

55% of the students are boys.
60% of the boys have school dinners.

How many girls have packed lunches?
You must show all your working.

....

(Total for Question 9 is 4 marks)

10 Tom uses his lorry to deliver bricks.

You can use this graph to find the delivery cost for different distances.
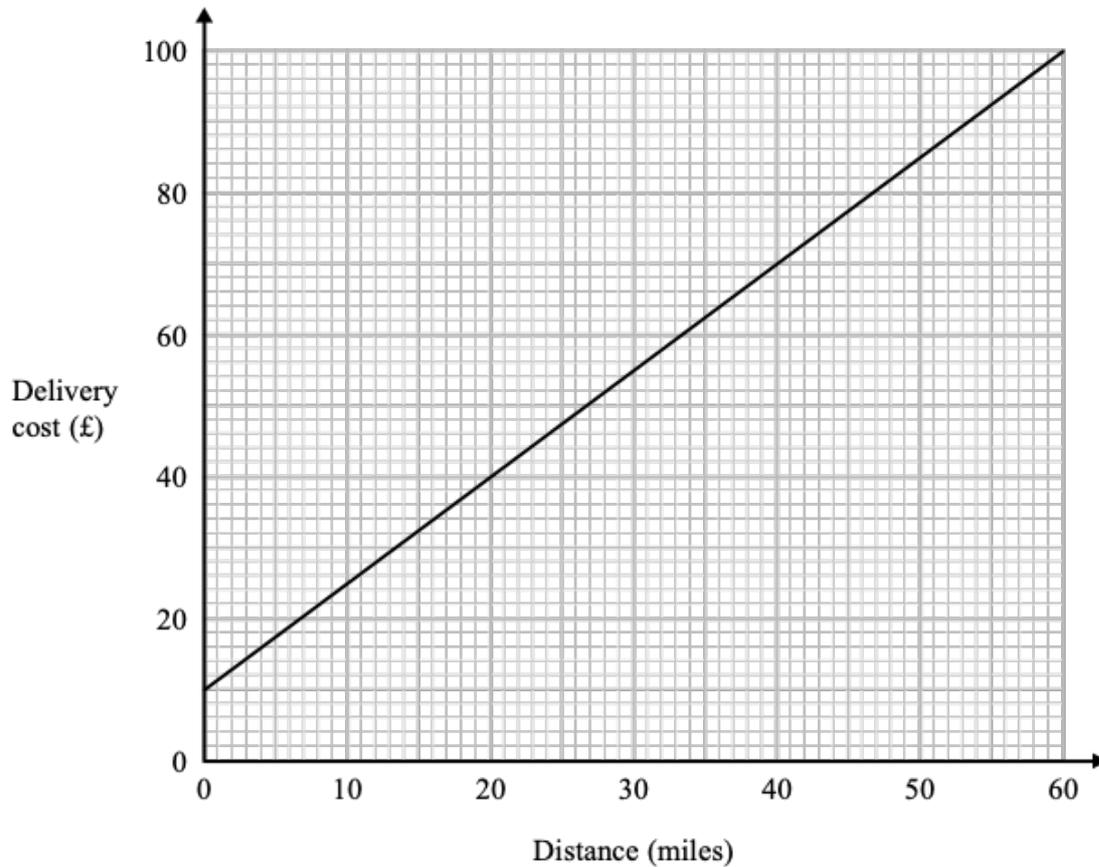
For each delivery, there is a fixed charge plus a charge for the distance.

(*a*) How much is the fixed charge?

£ ....

(1)

Tom makes two deliveries of bricks.
The distance of one delivery is 20 miles more than the distance of the other delivery.

(*b*) Work out the difference between the two delivery costs.

£ ....

(2)

(Total for Question 10 is 3 marks)

11 Azmol, Ryan and Kim each played a game.

Azmol's score was four times Ryan's score.
Kim's score was half of Azmol's score.

Write down the ratio of Azmol's score to Ryan's score to Kim's score.

....

(Total for Question 11 is 2 marks)

12 Last year the cost of a season ticket for a football club was £560.
This year the cost of a season ticket for the club has been increased to £600.

Write down the increase in the cost of a season ticket as a fraction of last year's cost.

....

(**Total for Question 12 is 2 marks**)

13   The table shows information about the numbers of points scored by 30 students in a quiz.

Number of points	Frequency
0	4
1	3
2	7
3	5
4	6
5	5

(*a*)   Find the modal number of points.

....

(1)

(*b*)   Work out the total number of points scored.

....

(2)

(Total for Question 13 is 3 marks)

14   Here is the charge at a car park in Spain.

> **Car   park**
>
> 0.024 euros per minute

Jon parked his car in this car park.

Jon drove into the car park at 10 45
When he drove out of the car park he had to pay 8.40 euros.

At what time did Jon drive out of the car park?

....

(Total for Question 14 is 3 marks)

---

15   A force of 70 newtons acts on an area of 20 cm^2

The force is increased by 10 newtons.
The area is increased by 10 cm^2

$$pressure = \frac{force}{area}$$

Helen says,

> "The pressure decreases by less than 20%"

Is Helen correct?
You must show how you get your answer.

38

16   A cycle race across America is 3069.25 miles in length.
Juan knows his average speed for his previous races is 15.12 miles per hour.
For the next race across America he will cycle for 8 hours per day.

(*a*) Estimate how many days Juan will take to complete the race.

....
(3)

Juan trains for the race.
The average speed he can cycle at increases.
It is now 16.27 miles per hour.

(*b*) How does this affect your answer to part (*a*)?

....

...

....

...

(1)

(Total for Question 16 is 4 marks)

---

17   Lara is a skier.

She completed a ski race in 1 minute 54 seconds.
The race was 475 m in length.

Lara assumes that her average speed is the same for each race.

(*a*)   Using this assumption, work out how long Lara should take to complete a 700 m race.
Give your answer in minutes and seconds.

.... minutes .... seconds

(3)

Lara's average speed actually increases the further she goes.

(*b*)   How does this affect your answer to part (*a*)?

....

....

(1)

(Total for Question 17 is 4 marks)

18   Last year Jo paid £245 for her car insurance.
This year she has to pay £883 for her car insurance.

Work out the percentage increase in the cost of her car insurance.

....%

(Total for Question 18 is 3 marks)

19 Ben is n years old.
Chloe is twice as old as Ben.
Dan is five years younger than Ben.

The total of Ben's age, Chloe's age and Dan's age is T years.

(a) Find a formula for T in terms of n.

....
(3)

(b) In the table below, put a tick ($\checkmark$) in the box next to the identity.

$3h + 2 = 14$	
$3a + 4b - 2c$	
$A = \pi r^2$	
$5m - 3m = 2m$	
$x + 7 \leqslant 12$	

(1)

(Total for Question 19 is 4 marks)

20 Kiaria is 7 years older than Jay.
Martha is twice as old as Kiaria.
The sum of their three ages is 77.

Find the ratio of Jay's age to Kiaria's age to Martha's age.

....

(Total for Question 20 is 4 marks)

21 Mr Page uses oil to heat his home.

At the beginning of November there were 1000 litres of oil in his oil tank.

Mr Page bought enough oil to fill the tank completely.
He paid 50p per litre for this oil.
He paid a total amount of £750.

At the end of February Mr Page had 600 litres of oil in the tank.
He bought enough oil to fill the tank completely.
The cost of oil had increased by 4%.

Work out the total amount Mr Page paid for the oil he bought in February.

(Total for Question 21 is 5 marks)

22   On Saturday, some adults and some children were in a theatre.
The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\dfrac{3}{4}$ of the children had seats in the Stalls.
117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?
You must show how you get your answer.

23   The density of apple juice is 1.05 grams per cm^3.

The density of fruit syrup is 1.4 grams per cm^3.

The density of carbonated water is 0.99 grams per cm^3.

25 cm^3 of apple juice are mixed with 15 cm^3 of fruit syrup and
280 cm^3 of carbonated water to make a drink with a volume of 320 cm^3.

Work out the density of the drink.
Give your answer correct to 2 decimal places.

....g/cm^3

(Total for Question 23 is 4 marks)

24   Hannah is planning a day trip for 195 students.

She asks a sample of 30 students where they want to go.
Each student chooses one place.

The table shows information about her results.

Place	Number of students
Theme Park	10
Theatre	5
Sports Centre	8
Seaside	7

(i)   Work out how many of the 195 students you think will want to go to the Theme Park.

....
(2)

(ii) State any assumption you made **and** explain how this may affect your answer.

....

....

....
(1)

(Total for Question 24 is 3 marks)

25 The table shows the costs of sending a parcel by the Express service and by the Rapid service.

Type of service	Cost
Express	£15.25
Rapid	£35.38

Brendan has to send 12 parcels.
It will be cheaper to send the parcels by the Express service than by the Rapid service.

(*a*)   How much cheaper?

£...
(3)

Luke wants to send 21 parcels by the Express service.

He does the calculation 20 × £15 = £300 to estimate the cost.

(*b*)   Explain why Luke's calculation shows the actual cost will be more than £300

....

....

....
(1)

(Total for Question 25 is 4 marks)

26 Each person in a fitness club is going to get a free gift.
Stan is going to order the gifts.

Stan takes a sample of 50 people in the fitness club.
He asks each person to tell him the gift they would like.

The table shows information about his results.

Gift	Number of people
sports bag	17
gym towel	7
headphones	11
voucher	15

There are 700 people in the fitness club.

(i) Work out how many sports bags Stan should order.

....

(2)

(ii) Write down any assumption you made **and** explain how this could affect your answer.

....

....

....

....

(1)

(Total for Question 26 is 3 marks)

27   A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm^3

Work out the volume of the gold bar.
Give your answer correct to 3 significant figures.

.... cm^3

(Total for Question 27 is 3 marks)

28 Harley's house has a value of £160 000 correct to 2 significant figures.

(*a*) (i) Write down the least possible value of the house.

£ ....
(1)

(ii) Write down the greatest possible value of the house.

£ ....
(1)

The value of Rita's house increased by 5%.
Her house then had a value of £210 000.

(*b*) Work out the value of Rita's house before the increase.

£ ....
(2)

(Total for Question 28 is 4 marks)