Name: _____

Class: _____

Teacher: _____

Year 9 set 5

Term 3

Homework Booklet

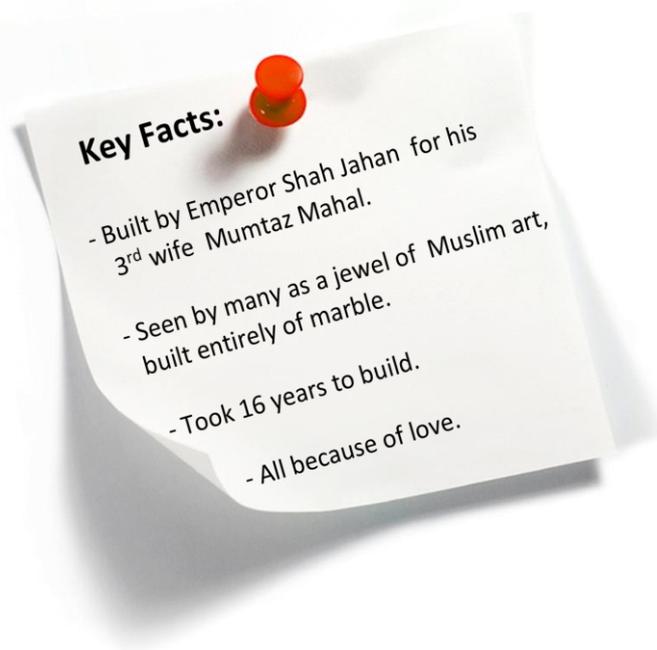| Week 1	
1: Calculate 87 + 88	C11: Find the circumference of a circle with a radius of 2 cm.
2: Fill in the missing spaces $$\frac{}{9} = \frac{15}{27} = \frac{35}{}$$	C12: Find the area of a circle with a radius of 2 cm.
3: Calculate $\frac{7}{9} - \frac{5}{9}$	13: Babies are expected to double their birth weight after about 5 months. A baby is born weighing w kg. Write an expression for their weight after about 5 months.
4: Calculate $\frac{7}{9} \times \frac{5}{18}$	14: Simplify $4f - 6 + 3f - 8$
5: Simplify the ratio 21:35	C15: Find the value of $12 - 3f$ when $f = 3$
6: A 100ml tub of ice cream costs £1.50. Work out how much a 500 ml tub of ice cream would cost.	16: Calculate 5 - 2 + 3
7: Find the next two terms of this sequence. 7, 13, 19, 25, ……, ……,	17: Expand $3(5 - 2f)$
8: Draw the next picture in this pattern	18: Factorise $6f - 8$
9: Find the nth term of the sequence 7, 13, 19, 25, …	C19: Solve the equation $6f - 8 = 1$
10: Write the name of this part of a circle	20: 8 x 9
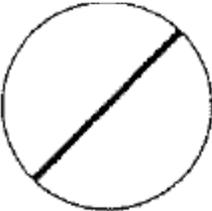
Trip to India

The Taj Mahal

It's the summer holidays and you and a friend decide to unwind and go for a holiday to India.

You visit the Taj Mahal in Agra India. You see it from afar and are amazed, WOW!

Your friend asks you:

'Wonder how much paint is needed to keep it looking so good?'

Key Facts:

- Built by Emperor Shah Jahan for his 3rd wife Mumtaz Mahal.

- Seen by many as a jewel of Muslim art, built entirely of marble.

- Took 16 years to build.

- All because of love.

You reply chuckling:

' That's easy my friend the answer is.................................'

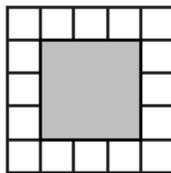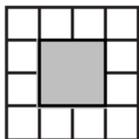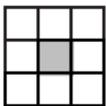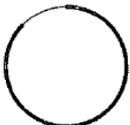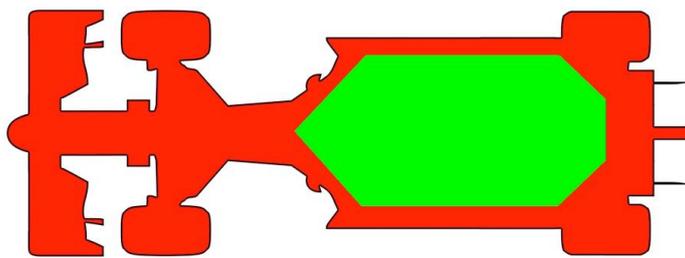| Week 2	
1: Halve 146	C11: Find the circumference of a circle with a diameter of 10 cm.
2: Fill in the missing spaces $$\frac{5}{} = \frac{}{18} = \frac{35}{42}$$	C12: Find the area of a circle with a diameter of 10 cm.
3: Calculate $\frac{9}{10} - \frac{3}{10}$	13: A football game lasts 90 minutes plus extra time. A game has e minutes extra time. Write an expression for the total length of the football game.
4: Calculate $\frac{9}{10} \div \frac{3}{5}$	14: Simplify $3g + 5h - 7g + 2h$
5: Share £60 in the ratio 5:7	C15: Find the value of $5g + 3h$ when $g = 2$ and $h = -1$
6: A 300g box of breakfast cereal costs £1.30. Work out the cost of a 600g box of the cereal.	16: Calculate 9 x 7 - 4 x 5
7: Write down a term to term rule for this sequence 7, 13, 19, 25, …	17: Expand $8(3g + 5h)$
8: Draw the next picture in this pattern	18: Factorise $12g + 18h$
9: Find the nth term of the sequence 9, 15, 21, 27, …	19: Solve the equation $7g - 5 = 2$
10: Write the name of this part of a circle	20: 6 x 8

Week 2

F1 Car Designer

Ultimate Job 2

Congratulations you have completed your degree and have landed your self a dream job as a junior F1 car designer working for the UK based McLaren team.

Your team is currently working on designing the largest possible fuel system that can be housed in the F1 car.

Below, is a scale drawing of the F1 car (You will need to use a ruler for this exercise)

Key Facts:
- Only the green area can house the fuel tank

- Scale 1cm = 40cm

1) You need to design a fuel tank to maximize the space available (think about compound shapes) what are the dimensions you are going to use?

2) Calculate the maximum surface area of your shape.

3) If the fuel tank is 40cm tall/high (actual height), calculate the volume of the tank.
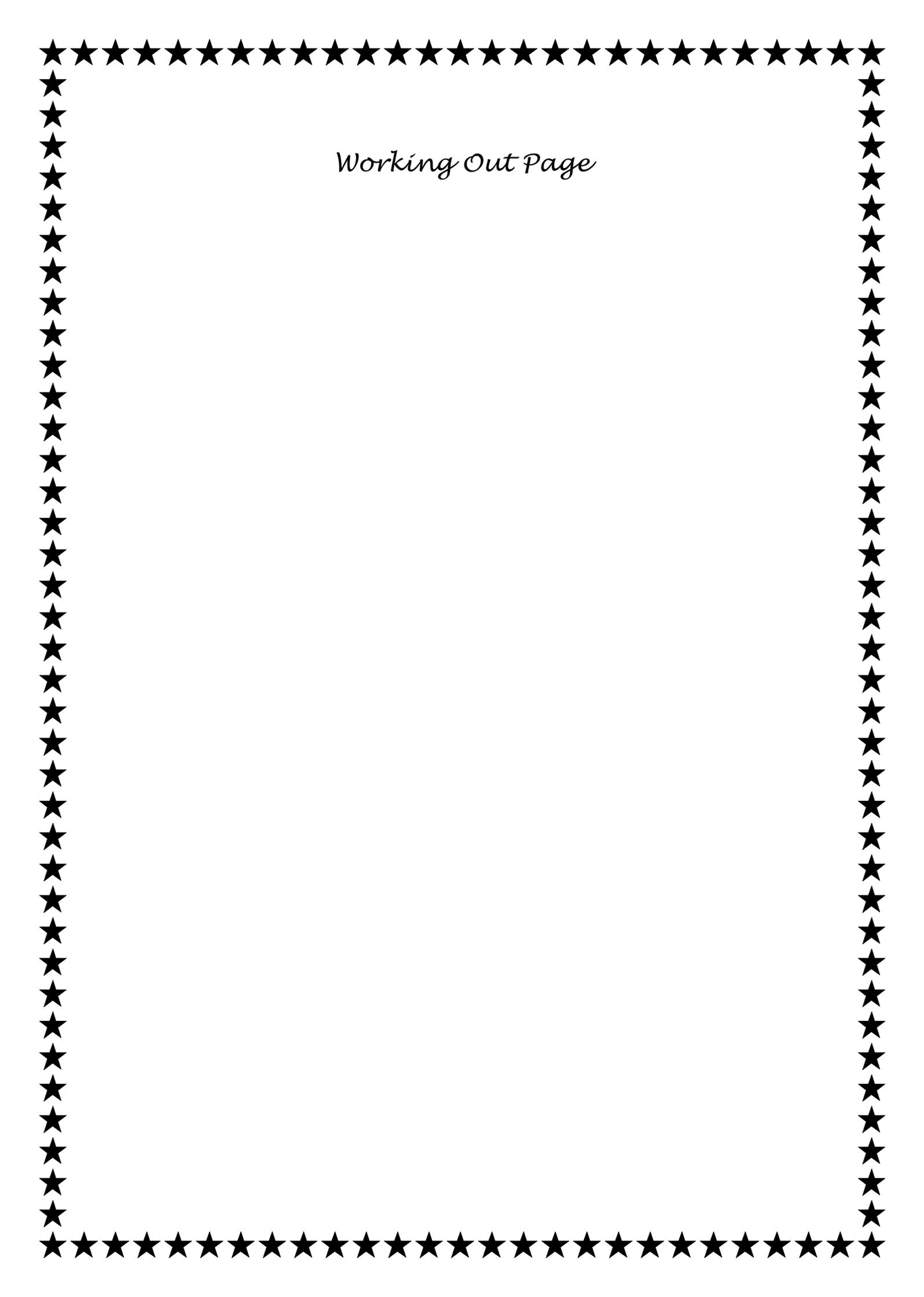
Working Out Page

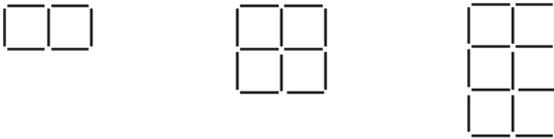| Week 3	
1: Calculate 930 ÷ 100	C11: Find the circumference of a circle with a radius of 18 cm
2: Fill in the missing spaces $$\frac{5}{} = \frac{}{42} = \frac{20}{56}$$	C12: Find the area of a circle with a radius of 18 cm
3: Calculate $\frac{5}{12} + \frac{1}{12}$	13: A case of drinks cans has 24 cans in. James drinks c cans. Write an expression for the number of cans left in the case.
4: Calculate $\frac{5}{12} \times \frac{1}{4}$	14: Simplify $5j - 3 - 7j + 9$
5: Share £80 in the ratio 1:3:4	C15: Find the value of $12 - 5j$ when $j = 6$
C6: A recipe for 4 scones costs uses 250g of butter. Work out the amount of butter needed for 6 scones.	16: Calculate 9 x (4+5) ÷ 2
7: Fill in the missing terms for this sequence. 8, ……., 22, 29, ……, ……, 50	17: Expand $10(4j - 7)$
8: Draw the next picture in this pattern	18: Factorise $15 - 6j$
9: Find the nth term of the sequence 14, 26, 38, 50, …	19: Solve the equation $8j + 7 = 11$
10: Write the name of this part of a circle	20: 8 x 7

Week 3

Medical Research Engineer
Ultimate Job 1

Congratulations you have completed your degree and have landed yourself a dream job as a Junior Medical Research Engineer.
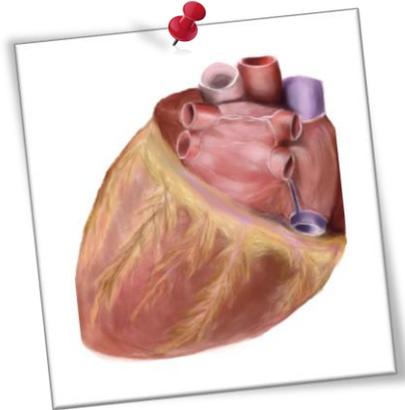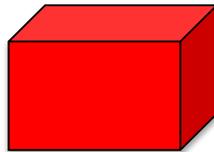
Your team is currently working on designing the most efficient artificial heart.

Your team has decided to choose a cube/cuboid as a starting point for your artificial heart.

Key Facts:
- The average heart pumps 70ml of blood per beat
- 1ml = 1cm^3

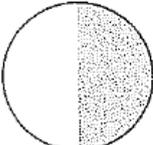1) What dimensions does your cube/cuboid need to have to ensure a 70ml of blood is pumped each beat?

2) The material you construct your heart from is 5mm thick, do you need to alter the dimensions of your heart? If so what are the new dimensions.

3) Is a cuboid the best choice for an artificial heart? What shape would you choose and why?

Working Out Page

Week 4	
1: Fill in the box to complete the calculation $$\boxed{} - 54 = 89$$	C11: Find the circumference of a circle with a diameter of 11 cm.
2: Write either a <, > or = between the two fractions. $$\frac{7}{12} \qquad \frac{11}{18}$$	C12: Find the area of a circle with a diameter of 11 cm.
3: Calculate $\frac{7}{8} - \frac{5}{8}$	13: 16 year old men are approximately 3 times taller than their height at 3 years old. A 16 year old man is t cm tall. Write an expression for the approximate height of the man at 3 years old.
4: Calculate $\frac{7}{8} \div \frac{5}{6}$	14: Simplify $5k + 4m + 7 + 8k + 3m + 10$
5: Sam and Meena share sweets in the ratio 4:5. Sam gets 24 sweets. Work out how many sweets that Meena gets.	C15: Find the value of $4k - 7m$ when $k = 0.5$ and $m = 4$
C6: A pack of 6 yoghurts cost £1.14. Work out how much a pack of 10 yoghurts would cost.	16: Calculate $\sqrt{3^2 + 4^2}$
7: Find the next two terms of this sequence 17, 14, 11, 8, ……, ……	17: Expand $7(3 - k + 4m)$
8: Draw the next picture in this pattern	18: Factorise $6k - 60$
9: Find the nth term of the sequence 8, 11, 14, 17, …	19: Solve the equation $12k - 10 = 86$
10: Write the name of this part of a circle	20: 7 x 12

Week 4 <u>**Mathematics – reading task.**</u>

<u>**Five statistics reveal the depth of Arsenal's humiliation**</u>

It was supposed to be the game in which Arsenal proved they were strong title contenders, when they demonstrated they had staying power.

Instead, Arsene Wenger's team were humiliated 5-1 by Liverpool at Anfield, heading back to London chastened and with enough unwanted statistics to keep their heads bowed and fans of Brendan Rodgers' side crowing.
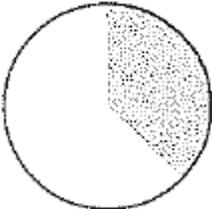
After two goals apiece from Martin Skrtel and Raheem Sterling and one from Daniel Sturridge, only Mikel Arteta replied for Arsenal. Here are 5 stats which tell the story of a momentous match:

1. Arsenal's embarrassingly big defeats in those two games (today's against Liverpool and at City) means that 42% of the goals they have conceded in the Premier League this season have come in two matches.
2. Arsenal have conceded a higher proportion of set-piece goals than any other premier League side this season: 43%.
3. Liverpool scored four of their goals before the break to bring their first-half tally for the season to 40, which was at least 10 more than any other side.
4. It was clear early on this could be a bad day for Arsenal. Liverpool scored their first goal after just 52 seconds, the first time they have managed a first-minute goal in a Premier League home game since December 1996
5. Liverpool's 63 goals after 25 Premier League matches is the most goals scored by the club at this stage in top-flight history.

<u>**Answer the following questions.**</u>

1. What % of goals have Arsenal conceded in their other matches this season?

2. How do you write 40 in a tally?

3. How many seconds are in a 90 minute football match?

4. How many years has it been since Liverpool last scored a goal in the first minute?

5. What is Liverpool's average number of goals per match?

Week 5

1: Double 178	C11: Find the circumference of a circle with a radius of 3 cm
2: Write either a <, > or = between the two fractions. $$\frac{7}{10} \qquad \frac{13}{18}$$	C12: Find the area of a circle with a radius of 3 cm
3: Calculate $\frac{11}{12} - \frac{7}{12}$	13: A hotel has h rooms. 9 of the rooms are currently occupied. Write an expressions for the number of available rooms at the hotel.
4: Calculate $\frac{11}{18} \times \frac{7}{12}$	14: Simplify $10n - 6p + 3q - 4n + 8p - 6q$
5: Sam and Meena share sweets in the ratio 4:5. Meena gets 40 sweets. Work out how many sweets that Sam gets.	C15: Find the value of $n + p - 2q$ when $n = p = q$
C6: A car can travel 120 miles on 30 litres of petrol. Work out how far the same car can travel on 35 litres of petrol.	16: Calculate $12 - \sqrt{64}$
7: Write down a term to term rule for this sequence 17, 14, 11, 8, …	17: Expand $-5(3n + 2p + q)$
8: Draw the next picture in this pattern 	18: Factorise $3n + 6p - 9q$
9: Find the nth term of the sequence 7, 10, 13, 16, …	19: Solve the equation $6p - 2 = 0$
10: Write the name of this part of a circle 	20: 12 x 12

Week 5 - Mathematics – reading task.

There are still no signs of things getting easier for flooded parts of the UK, as more wild weather has been forecast.

The Met Office has severe weather warnings in place for parts of south Wales and south-west England, warning that, "with ongoing flooding in some places, any further rain will only add to the problems".

BBC weather forecaster Laura Gilchrist said Tuesday would be a "kitchen sink day of weather" with "a bit of everything" expected.

She also said that on Wednesday some parts of the country could get hit by the strongest wind so far this winter.
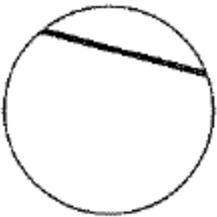
There are also two warnings of snow for Tuesday - covering Scotland, northern England and Northern Ireland - and a warning of ice for Northern Ireland.

Answer the following questions.

1) Label the compass with the 8 points
   N, W, S, E, NW, SE, SW, NE.

2) At what temperature does water freeze?

3) If there is 12 cm of rain, how many mm is this?

Week 6

1: Multiply 7.8 by 1000	C11: Find the circumference of a circle with a diameter of 5 cm.
2: Write either a <, > or = between the two fractions. $$\frac{9}{11} \qquad \frac{45}{55}$$	C12: Find the area of a circle with a diameter of 5 cm.
3: Calculate $\dfrac{13}{18} - \dfrac{7}{18}$	13: A box of Lego has b bricks. 10 of the pieces get lost. Write an expression for the number of bricks left.
4: Calculate $\dfrac{13}{18} \div \dfrac{7}{10}$	14: Simplify $4r^2 + 5r - 3r^2 + 7r$
5: Sam and Meena share sweets in the ratio 4:5. Meena gets 20 sweets more than Sam. Work out how many sweets that Sam gets.	C15: Find the value of $4r^2$ when $r = 3$
C6: 40 litres of petrol costs £45.96. Work out the cost of 50 litres of petrol.	16: Calculate 8 + 4 x 6 - 5
7: Fill in the missing terms in this sequence: 20, ..., 8, ..., -4,	17: Expand $4(-3r - 5)$
8: Draw the next picture of this pattern	18: Factorise $r^2 + 5r$
9: Find the nth term of the sequence 14, 20, 26, 32, …	19: Solve the equation $100r + 5 = 15$
10: Write the name of this part of a circle	20: 11 x 13

<u>Week 6 - Mathematics – reading task.</u>

It's always a good idea to make sure a parent, teacher or guardian knows when you're surfing the net.

That way, if you see or are sent anything that makes you feel uncomfortable or upset while you're online, you can tell them.

What information shouldn't I put online?

Don't give out any personal information online as people may use it to contact you when you don't want them to.
Unless you have an adult's permission, never give out:

- Your real name or your friends' names
- Your home, school or email address
- Your home or mobile phone numbers
- A photo of yourself
- Your parents' bank or credit card details

Do passwords keep you safe?

Only if you keep them completely secret - don't even tell your best friend.
And try not to use names of your family or pets, because people can guess them quite easily.

Use a mix of letters and numbers instead.

<u>Answer the following problem.</u>

If I have a password using the letters and numbers **M, A, T, H** and **5** how many different combinations are there?

Can you list them all below?