Westbourne House School
Revision – Christmas Term

Y8S MATHS REVISION CHECKLIST

In addition to revising all the topics on the 8CE page you should also be revising the following.

The Exam will consist of:

- One paper of 90 minutes long:
  - Section A: Short questions testing algebra and number work – duration about 45 minutes
  - Section B: Longer more "thinky" questions – duration about 45 minutes

Equipment you will need for the exam:

- Ruler (15cm and 30cm)
- Pencil
- Eraser and pencil sharpener
- Compass
- Protractor

TOPIC / PAPER	WHAT TO REVISE	DONE?
Section A	Example questions on number and algebra. 1. Simplify the following expressions: • $7a^2 - 3a + 4a^2$ • $12a^2 \times 3a^3$ • $\frac{8c - 4c}{2c}$ • $a^3 \times a^{-3}$ • $3(4x + 6) - 2(x - 6)$ (8 marks) 2. Solve the following equations: • $4(2x - 1) = 10$ • $3(4x - 1) - 2(x + 3) = 16$ • $3 + \frac{7}{a} = \frac{24}{a}$ • $\frac{3}{x + 6} = \frac{2}{3 - x}$ (10 marks)	

3. Simplify the following expressions:

- $\frac{a}{3} \div 3a$
- $\frac{3}{y} \times \frac{2y}{6}$
- $\frac{4}{x^2} \div \frac{16}{x^3}$

(5 marks)

4. Expand the following:

- $3x(x-8)$
- $(x-7)(x-5)$
- $(x+5)^2$

(5 marks)

5. Factorise the following fully:

- $15x^3 - 5x$
- $x^2 - 25$
- $a^2 - 2a + 1$

(6 marks)

6. Solve the following simultaneous equation

$$2x - 3y = -10$$
$$3x + 5y = 42$$

(5 marks)

7.

- Write 15% as a fraction in it's lowest terms
- Write 0.085 as a percentage
- Work out 45% of 250
- What is the reciprocal of 0.4
- Using each of the following values once and the four operands (+, –, x, ÷) make 24.

  4 5 6 7

(5 marks)

8. I put £250 in a bank and get 5% interest a year. How much money do I have after 5 years

(2 marks)

9. If a car is bought for £5000 and depreciates at 15% a year. How much is it worth after 3 years.

(Leave your answer in index form)

(2 marks)

10. In a sale a jacket costs £84 this is after a 25% discount. How much was the jacket originally?

	11. • $7\frac{4}{6} \times \frac{5}{8} \div \frac{23}{40}$ • $\frac{6}{7} + \frac{7}{8} \times \frac{2}{5}$ 12. • Write 168 as a product of it's primes in index form. • What is the smallest number 168 needs to be multiplied by to make it a perfect square?	
Section B	Below is a selection of questions from an old CASE paper. It is good revision as it shows the type of "thinky" questions that are now in the Section B. 4. Fred, George and their boss work at the same office from Monday to Friday. They should start at 9am, but Fred and George are not very good at arriving on time. Fred is always 10 minutes late on Mondays, Tuesdays and even-numbered Fridays. George is always 10 minutes late on Thursdays and on all even-numbered days. (i) **On the separate sheet**, complete the table for this month showing on which days Fred and George are late. working days during February 2009 Monday: 2 FG; 9 Tuesday: 3 F; 10; 17 Wednesday: 4 G; 11 Thursday: 5 G; 12; 19 Friday: 6 FG; 13 (2) (ii) If their boss arrives at 9am on a randomly-chosen day this month, what is the probability that both Fred and George arrive after him? (1) (iii) What is the probability this month (a) that when Fred is on time, George is late? (2) (b) that when George is on time, Fred is late? (2) (iv) If you were the boss and you were on holiday for the whole of February, would you give the keys to open the office to Fred or to George? Explain your answer. (2)	

6. This question is about a special set of numbers – we will call them **Very Odd Numbers**.

A whole number is a Very Odd Number (or VON for short) if

- all its digits are odd **and**
- when you multiply it by 3 you produce another number, all of whose digits are odd

For example 193 is a VON, because

- 1 and 9 and 3 are all odd digits **and**
- 193 × 3 = 579 (5 and 7 and 9 are all odd digits too)

But 137 is **not** a VON, because 137 × 3 = 411 (the 4 is **not** an odd digit).

(i) Write down the four VONs between 100 and 120 (2)

(ii) Explain carefully why a three-digit VON **cannot** have a 5 as its units digit. (2)

(iii) Write down the only two VONs between 121 and 149 (1)

There are **fifteen** numbers between 150 and 199 which have entirely odd digits.
Only **eight** of them are VONs.

(iv) Write down the eight VONs between 150 and 199 (2)

(v) Explain carefully why there are **no** VONs between 700 and 999 (2)

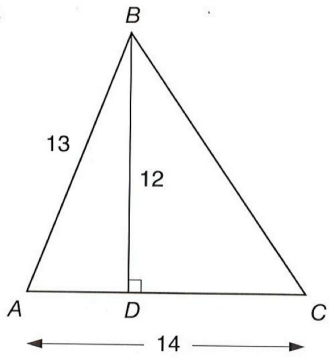
(vi) Find out how many **three-digit** VONs there are.
(You need not list them all, but you must explain how you arrive at your answer.) (2)

None of the diagrams in this question is to scale.

7. A triangle *ABC* is shown on the right and below.

The lengths of *AB* and *AC* are 13 cm and 14 cm respectively.

The line *BD* is perpendicular to the side *AC* and is 12 cm long.

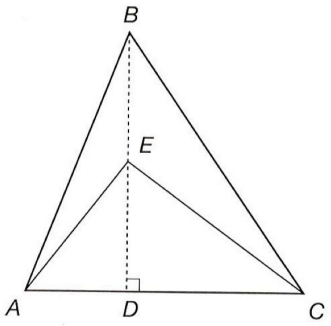


(a) Find the length of

(i) the line *AD* (2)

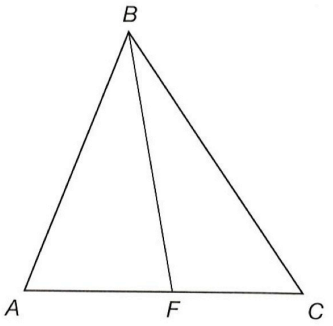
(ii) the side *BC* (2)

E is the midpoint of the line *BD*.



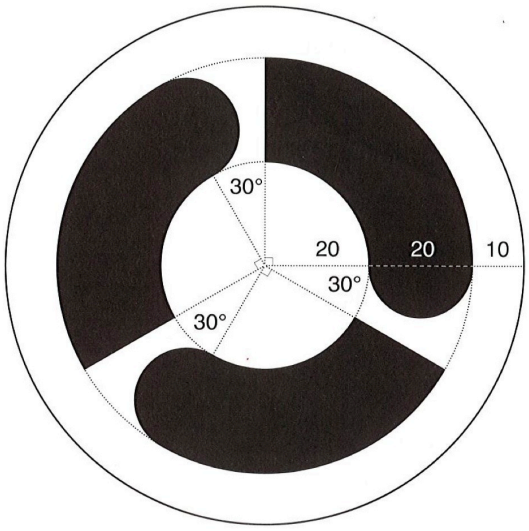
(b) Find the area of the quadrilateral *ABCE*. (2)

A line is drawn from *B* to a point *F* on the line *AC* in such a way that the perimeter of triangle *ABF* is equal to that of triangle *BFC*.



(c) Find the ratio of the lengths of the lines *AF* and *FC* in its simplest terms. (3)

8. The design for a roundabout sign is shown below with measurements in centimetres.

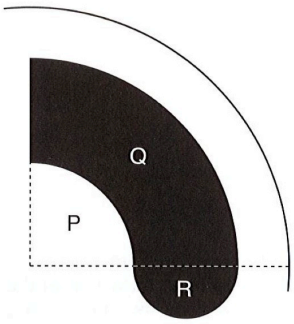


The outside circle has a radius of 50 cm.

The two concentric inner circles have radii of 20 cm and 40 cm.

Each black piece is a 90° ring section (Q) joined to a 10 cm radius semicircle (R).

Leave your answers to parts (i) to (v) in terms of π. Simplify all answers where possible.



(i) Find the area of the sector marked P. (2)

(ii) Find the area of the 90° sector made up of section P and section Q. (1)

(iii) Find the area of section Q. (1)

(iv) Find the area of semicircle R. (2)

(v) Find the total area of the three black pieces. (2)

(vi) Express your answer to part (v) as a percentage of the area of the whole sign. (2)