

The Year 9 Maths Entrance Exam will include some questions which involve **problem solving, investigation** and/or **mathematical comprehension**. This is a sample of such questions.

Standard methods and their application to solving problems will still form a significant part of the test, but applicants will also be expected to engage with new material and think creatively.

**11.** Dan and his workers are painting houses. It takes 8 of Dan's men to paint 12 houses in 9 days.

**a.** How long will it take 8 of Dan's men to paint 30 houses?

Answer \_\_\_\_\_ [2]

**b.** How long will it take 5 of Dan's men to paint 20 houses?

13. The singlesum of a number is the repeated sum of its digits until a single digit remains.

For example the singlesum of 2482 = 7, because:

$$2 + 4 + 8 + 2 = 16 \text{ then } 1 + 6 = 7$$

a. Write down the singlesum of 998.

Answer: \_\_\_\_\_ [1]

b. Write down the **odd** number between 200 and 220 with singlesum equal to one

Answer: \_\_\_\_\_ [1]

A number is called **special** if its singlesum adds to 4 or 7. For example 4 and 7 are **special**, as is 133 because  $1 + 3 + 3 = 7$

c. Is 4444 **special**?

Answer: \_\_\_\_\_ [2]

d. Write down all the **special** numbers between 60 and 80

Answers: \_\_\_\_\_ [2]

e. Find the first even number greater than 4, which when squared has a **special** number as an answer.

Answer: \_\_\_\_\_ [2]

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A magic square is a  $3 \times 3$  grid completed such that each row, column and diagonal add to the same total, called the **magic number**.

- (a) In the following magic square, the magic number is  $3x + 3y$ . Use this information to complete the square.

	$2x + 2z$	
	$x + y$	
$x + z$		

- (b) A second magic square is given as follows. Work out what the magic number is for this square. (Give your answer in terms of  $a$ . It is recommended you try to work out what some of the entries in the magic square are, but it is not necessary to fill them all in.)

		1
	$1 - a$	
	$2 - 2a$	