

Middle School Mathematics

Time Allowed

Section A - 40 minutes; Section B - 40 minutes

These tasks give you a chance to show what you know and how you reason, and to solve mathematical problems.

Please show your work and reasoning in the spaces provided. Explain any assumptions you make.

**Try as many tasks as you can in the time given.
If you get stuck on a task, move on to the next task.**

Name: _____	Male	Female
School: _____	City: _____	
Teacher: _____	Grade: _____	
Date: _____		

Do not write in the box below:

MS-6	Short Tasks	Meal Out	Photo graphs	How Old Are They?	Jane's TV	Lottery	Roman Mosaic	Total

Section A - 40 minutes

Short Tasks

1. The price of a cycle is reduced by 25 per cent. The new price is reduced by a further 20 per cent. Find the single reduction the two reductions together are equal to.

2. Draw a circle around the expression which is greatest when n is a negative number.

$n - 2$

$2n$

n^2

$-\frac{n}{2}$

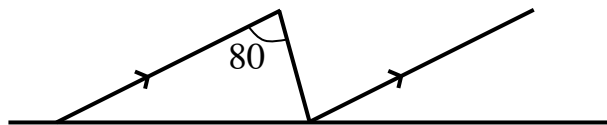
$\frac{2}{n}$

3. Use a calculator to find the value of

$$\sqrt{(5.4(5.4 - 4.8)(5.4 - 3.4)(5.4 - 2.6)}$$

Give your answer correct to one decimal place.

4. On this diagram label another angle whose size is 80° .



5. Joe has a bag containing 8 red sweets, 9 yellow ones and 11 green. He likes red sweets best.

He takes out a sweet and eats it, then, he takes out a second sweet.

What is the probability that both the sweets are red?

Meal Out

Ten friends go out for a meal.

Some friends have three-course meals and the rest have two-course meals.

The bill for all 10 meals is \$141 dollars.

The number of people who have three-course meals is x .

1. One of these equations can be solved to find the correct value of x .

$$15x + 12x = 141$$

$$15x + 12(x - 10) = 141$$

$$15x + 12(10 - x) = 141$$

$$(15 + 12)x = 141$$

$$15x + 12y = 141$$

Which is the correct equation? _____

2. Solve the equation and find the number of people who had three-course meals and the number of people who had two-course meals.

Show how you figured it out, and show that you have tested your answers to see they are correct.

Dinner Menu

Three-course meal
\$15

Two-course meal
\$12

See our delicious
choices overleaf!

Photographs

A photographer wants to print a photograph and two smaller copies on the same rectangular sheet of paper. The photograph is 4 inches wide and 6 inches high.

Here are two ways he could do it. (Note: the diagrams are not drawn to actual size.)

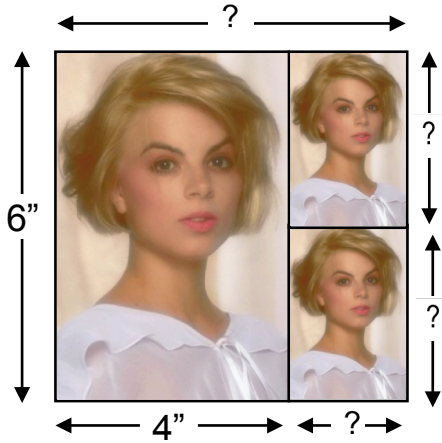


Diagram 1

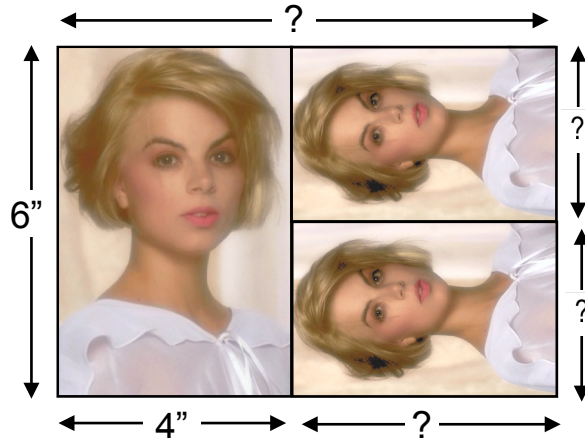


Diagram 2

1. Find the measurements of the small photographs for each arrangement. Show your calculations and explain how you figured it out.

Diagram 1

Diagram 2

2. Find the size of the sheet of paper for each arrangement.

Diagram 1

The measurements of the sheet of paper are _____ wide and _____ high.

Diagram 2

The measurements of the sheet of paper are _____ wide and _____ high.

How Old Are They?

Will is w years old.

Ben is 3 years older.

1. Write an expression, in terms of w , for Ben's age.

Jan is twice as old as Ben.

2. Write an expression, in terms of w , for Jan's age.

If you add together the ages of Will, Ben and Jan the total comes to 41 years.

3. Form an equation and solve it to work out how old Will, Ben and Jan are.

Will is _____ years old

Ben is _____ years old

Jan is _____ years old

Show your work.

4. In how many years time will Jan be twice as old as Will?

In _____ years time

Explain how you figured it out.

Jane's T.V.

Jane is hoping to buy a large new television for her den, but she isn't sure what size screen will be suitable for her wall.

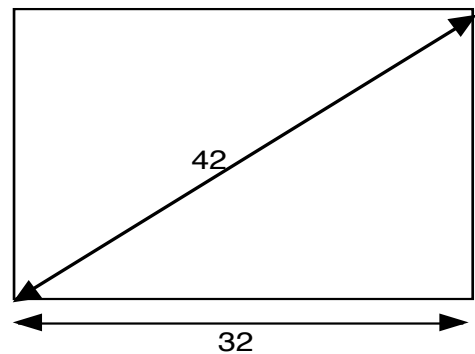


This is because television screens are measured by their diagonal line.

This 42 inch screen measures 32 inches along its base.

1. What is the height of its screen? _____

Show how you know.



2. What is the area of the screen? _____square inches

3. Jane would like to have a screen 40 inches wide and 32 inches high.

About what screen size will she need to buy? _____inches

Show how you figured this out

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Section B - 40 minutes

Lottery

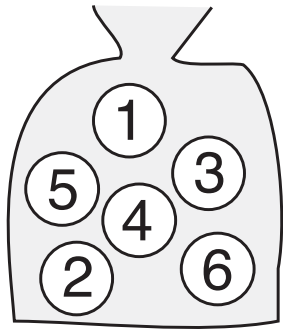
Karl is thinking of holding a mini lottery to raise money.

I will sell tickets like this for \$1 each.

1	2	3
4	5	6

Each player must put a cross through two numbers on the ticket and hand it in.

At the end of the week I will draw out two balls from a bag.



Every player who has chosen the same two numbers as shown on the balls will win a cash prize of \$10.

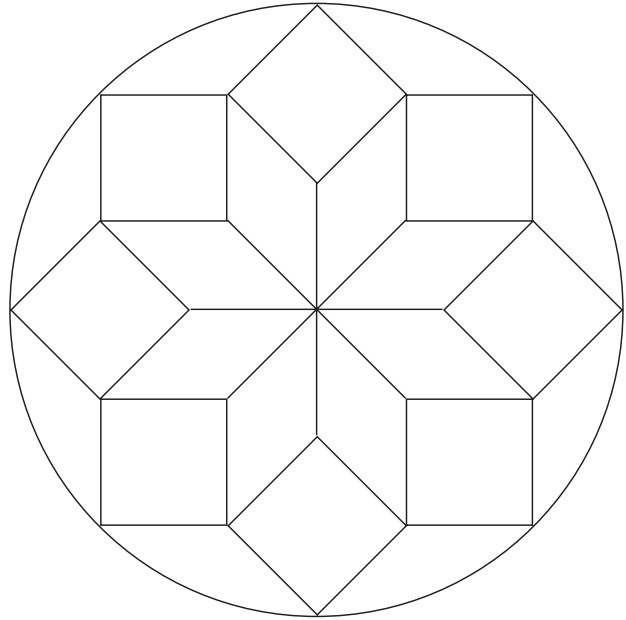


1. How many ways are there of choosing two different numbers on the ticket?
Show all your work.

Lottery continued

2. Will the lottery be a good money raiser?
Explain your reasoning, and show all your calculations.

Roman Mosaic



Imagine that you have just uncovered this old Roman floor mosaic in Spain¹.

You telephone New York to tell them about your exciting discovery.

Describe the complete pattern (shown above on the right) as precisely as you can, so someone else can draw it without seeing it. Try to describe the shapes, the symmetry and the angles.

¹ The photograph was taken by David Mateos Garcia and is licensed under Creative Commons Attribution 2.0. See: [Wikimedia commons](#)

Roman Mosaic continued
