

Product Rule for Counting

- (a) How many ways are there of arranging the word MATHS?
- (b) Ishaq wants to make a PIN code from the digits 1, 3, 5 and 7, using each digit once only. How many different PIN codes can he make?
- (c) How many different numbers can be made from the digits 2, 3, 4, 5 and 6?

$$(a) 120$$

$$(b) 24$$

$$(c) 120$$

- (a) 10 people are called for an interview. How many ways are there of arranging the order of the interviews?
- (b) 8 flags are to be flown outside a building hosting a world leaders' conference. How many ways are there for arranging the flags?
- (c) At a dog show, there is a gold, silver and bronze certificate for three top dogs. If 20 dogs enter, how many ways are there of awarding the certificates?

$$(a) 3628800$$

$$(b) 40320$$

$$(c) 20 \times 19 \times 18 = 6840$$

- (a) Using the digits 5, 6, 7 and 8 once each, how many possible numbers can be made that are multiples of 5?
- (b) Using the numbers 2, 3, 5, 7 and 9 once each, how many even numbers is it possible to make?

$$(a) 6$$

$$(b) 24$$

Dr Austin randomly chooses 2 of her 24 students to compete in a quiz against Mrs Barber's class.

- (a) How many ways are there of Dr Austin selecting her 2 students? Mrs Barber has 26 students in her class and must also select 2 students at random.
- (b) How many different possible selections of the 4 students competing in the quiz are there?

$$(a) 24 \times 23 = 552$$

$$(b) 24 \times 23 \times 26 \times 25 \\ = 358800$$