| IM1 Assessment 7		
Task 1	**Task 2**	
Make sure to Hand in your Problem Sets	Complete these questions. Answer all questions on separate sheets of paper. Make sure to SHOW YOUR WORKING where necessary and show your reasonings or explanations	Total 53 marks

| Assessment 7	

A1
 	
(2 marks)
	An 8 sided die is rolled. The faces of this 8 sided die are labeled with the numbers from 1 through 8. Find the theoretical probability of rolling:
	
	   a. An even number
	   b. A number less than or equal to 5

A2 **(2 marks)**	The probability that a spinner will land on yellow is $\frac{2}{7}$. What is the probability that the spinner will NOT land on yellow?

A3
 	
(3 marks)
	The spinner shown here is divided into 9 equal sections. What is the probability that:
	
	   a. the spinner lands on a 2?
	   b. the spinner does not land on a 1?

A4 **(5 marks)**	Here are two events. Calculate the theoretical probability of each and then decide which event is **more** likely to occur a. Event A: b. Event B Rolling a number that is less than 6 if a 6-sided die labelled 1 to 6 is rolled. Choosing a number that is odd if a ticket is chosen from a bag of 10 tickets labelled 1 to 10.
A5 **(4 marks)**	a. An experiment consists of rolling a standard 6 sided die and then tossing a fair coin. Abdullah is interested in finding the probability of rolling a number that is not divisible by 5 and then tossing tails. Are these events independent or dependent? Explain your choice. b. An experiment consists of drawing 2 marbles, one after another, from a box containing both green and blue marbles. One marble is taken out, its color is recorded, and then this marble is placed back into the box and then the second marble is selected. Leaticia is interested in knowing how probable it is to get 2 green marbles. Are these events independent or dependent? Explain your choice.
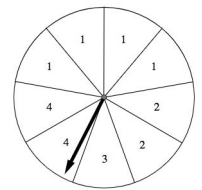
A6 **(4 marks)**	The letters in the word MATH are cut up and put into a bag. a. One letter is drawn and then replaced and then another letter is drawn. How many possible outcomes are there? b. One letter is drawn, but now this letter NOT replaced and then another letter is drawn. How many possible outcomes are there in this second option?
A7 **(3 marks)**	A fair coin is tossed and then a standard die is rolled. What is the probability of tossing heads and rolling a number that is divisible by 3?
A8 **(4 marks)**	The results of two experiments are shown below. Find the experimental probability of tossing tails in each experiment. a. (i) Experiment 1 (ii) Experiment 2 **Experiment 1** A fair coin is flipped 25 times. | Value	Frequency
Heads	13
Tails	12 | **Experiment 2** A fair coin is flipped 15 times. | Value	Frequency
Heads	4
Tails	11 | b. Can you predict which coin is "fair"? Why/why not?
A9 **(4 marks)**	Which of the following statements are supported by the law of large numbers? Select all that apply. ☐ a) If you roll a standard die 618 times, then the experimental probability of rolling a two will likely be close to 16.7%. ☐ b) If you roll a standard die 822 times, then it is likely you will roll a two close to 137 times. ☐ c) If you roll a standard die 484 times, then you will roll at least one number other than two. ☐ d) If you roll a standard die 648 times, then you will roll a two exactly 108 times.
A10 **(4 marks)**	If a standard die is rolled once, the probability of rolling a 1 is $\frac{1}{6}$ or about 17%. a. If you were to roll the die 12 times, how many times would you expect to roll a 1? b. If you were to roll the die 90 times, how many times would you expect NOT to roll a 1?
A11 **(3 marks)**	A ticket is drawn from a bag of tickets numbered 1 through 90. What is the event that is **complementary** to: a. drawing an odd numbered ticket b. drawing a ticket whose number is divisible by 3?
A12 **(3 marks)**	A spinner is divided into three sections labelled red, yellow and blue and the spinner is spun 3 times. There are 27 equally likely outcomes. What is the probability of landing on red at least once?

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A13 **(2 marks)**	A 10 sided die with the numbers 1 to 10 on its faces is rolled and a marble is drawn from a bag of 9 different coloured marbles. Calculate the total number of possible outcomes.

A14
 	
(4 marks)
	A 4 sided die with the numbers 1 to 4 on its faces is rolled and then a ticket is drawn from a bag of 6 tickets labelled 1 to 6.
	
	    a. How many different outcomes are possible?
	    b. How many different ways can you roll a 1 on the dice AND draw a 2 from the bag of tickets?
	    c. How many different ways can you roll a 1 on the dice OR draw a 2 from the bag of tickets?

A15
 	
(6 marks)
	An experiment is performed involving a dice and tickets in a bag. The die is a 10 sided die with the numbers 1 to 10 on its faces is rolled and then a ticket is drawn from a bag of 6 tickets labelled 1 to 6.
	
	    a. What is the number of possible outcomes for the die?
	    b. What is the possible number of outcomes for the bag of tickets?
	    c. What is the total number of possible outcomes in this experiment?
	    d. What is the probability of rolling a number that is divisible by 3 and drawing a numbered ticket that is not divisible by 3?

Geometry HINTS about working with parallel lines and triangles

Remember, **parallel** lines are straight lines which never meet or cross.
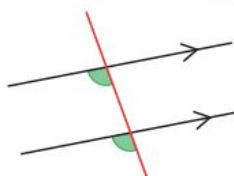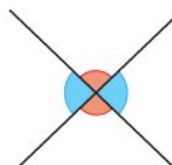
The arrows show that the lines are parallel
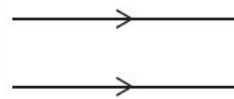
Alternate angles on parallel lines are equal. In this diagram, the alternate angles are on *alternate* sides of the red line.
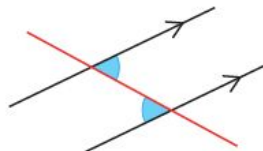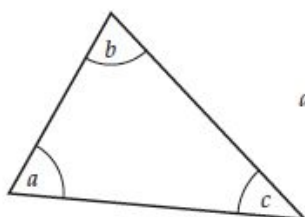
Corresponding angles on parallel lines are equal. In this diagram, the corresponding angles are on the *same* side of the red line.
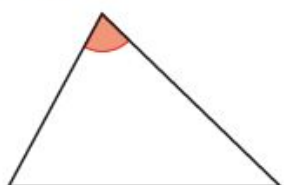
Remember, **vertically opposite** angles are also equal.

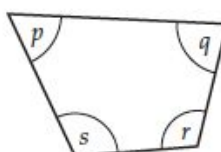**Geometry HINTS about working with angles in triangles:**

$a + b + c = 180°$

$p + q + r + s = 360°$

The sum of the angles in any triangle is 180°.

The sum of the angles in any quadrilateral is 360°.

An **interior** angle is *inside* the shape.
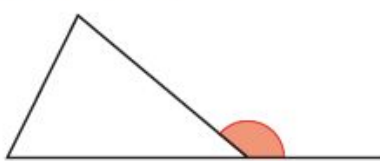
An **exterior** angle is *outside* the shape. It is made by extending one of the lines.
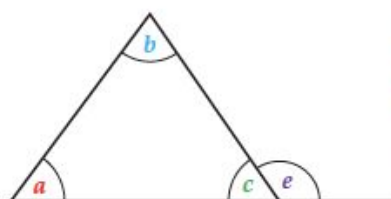
$c + e = 180°$
(angles on a straight line)
$a + b + c = 180°$
(angles in a triangle)
so $a + b = e$

The **exterior** angle of a triangle is equal to the sum of the two **interior** opposite angles.