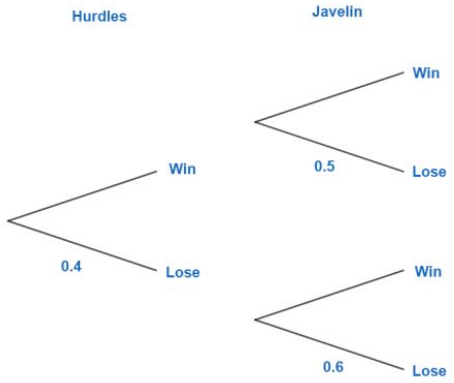
IM1 Problem Set 39		
Task 1	**Task 2**	**DC**
Put solutions to problems from the previous Problem Set on the board	Discuss all problems and come to a consensus. Record solutions in your notebooks and present solutions.	DC

Problem Set 39	
39.1	Use your knowledge of exponent rules to simplify the following expressions: 4. $2x^3 \cdot 2x^2$ 5. $\frac{6^5}{6^3}$ 6. $\frac{x^4}{x^7}$ 17. $\left(\frac{4x^5y}{16xy^4}\right)^3$ 18. $\left(\frac{5x^3y}{20xy^5}\right)^4$ 19. y^{-7} 29. $f^{-3}(f^2)(f^{-3})$ 30. $\frac{x^{-4}}{x^{-9}}$ 31. $\frac{24x^6}{12x^{-8}}$
39.2	A cylindrical container of three rubber balls has a height of 18 cm and a diameter of 6 cm. Each ball inside the container has a radius of 3 cm. Find the: a. volume of each of the balls; b. volume of the cylindrical container; c. amount of space in the container that is not occupied by the rubber balls. 
39.3	Two towns have been growing in their populations over the past 20 years. The population of Mathlaton is modeled by the equation $P(t) = 50{,}000(1.20)^t$, where t represents the time in years since 2000. The population of Niamburg is modeled by $P(t) = 50{,}000(0.80)^t$, where t represents the years since 2000. a. Graph both equations on your calculator. b. Which town has a growing population? Which town has a declining population? c. Compare the 2 equations. How can we know which town's population is decreasing **before** graphing? d. What was the population of both towns in the year 2000? 2010? 1980?
39.4	Bag A contains 10 marbles of which 2 are red and 8 are black. Bag B contains 12 marbles of which 4 are red and 8 are black. A ball is drawn at random from each bag. a. Draw a probability tree diagram to show all the outcomes of this game. b. Find the probability that: i. both are red. ii. both are black. iii. one black and one red. iv. at least one red.

39.5	Graph the following two exponential functions: let $y_1 = 5(2)^x$ and let $y_2 = 5(2)^x + 10$.Compare the two graphs and the 2 data tables and prepare a sketch of the graph in your notes and then label (i) the y-intercept, (ii) the asymptote and (iii) three additional data points. Do both graphs have $y = 5$ as a y-intercept?What is the effect of the +10 in the second equation?
39.6	Katie completes two events at her school sports day, hurdles and javelin. The probabilities that she wins each event have been summarised in the tree diagram below. Complete the tree diagram and use this information to calculate the probability that Katie wins one event and loses the other. 
39.7	From 1990 to 1997, the number of cell phone subscribers S (in thousands) in the US can be modeled by the equation $y = 5535.33(1.413)^t$, where t is number of years since 1990. a. BEFORE you graph the function, explain how you know that this is a growth curve. b. Sketch a graph of the model. Label three points on the function c. In what year was the number of cell phone subscribers about 31 million? d. According to the model, in what year will the number of cell phone subscribers exceed 90 million? e. Estimate the number of subscribers in 2010. f. Do you think this model can be used to predict future number of cell phone subscribers? Explain
39.8	Solve for the unknowns in the following geometric diagrams, showing parallel lines and a transversal drawn through the parallel lines.