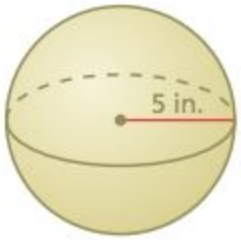
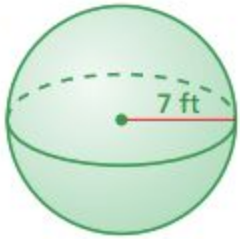
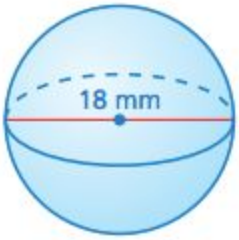
IM1 Problem Set 37		
Task 1	**Task 2**	**DC**
Put solutions to problems from the previous Problem Set on the board	Discuss all problems and come to a consensus. Record solutions in your notebooks and present solutions.	DC

Problem Set 37	
37.1	Use your knowledge of exponent rules to simplify the following expressions: 2) $(2a^2b)(4ab^2)$ 3) $(6x^2)(-3x^5)$ 7) $(5x^2y^4)^3$ 8) $(6x^4y^6)^3$ 12) $\frac{18c^3}{-3c^2}$ 13) $\frac{9a^3b^5}{-3ab^2}$ 17) $\left(x^2\right)^7$ 18) $\left(-2x^4\right)^5$
37.2	Determine the volume and surface area of the following spheres: **3.**  **4.**  **5.** 
37.3	Mr S invests some money into two different accounts. On the first account, he invested \$7500 and earns **compound interest** of 4% on every year on this investment. The future value of his money can be modeled using the equation $y = 7500(1 + r)^t$, where t represents the number of years that he owns the investment. The second account earns **simple interest** of 8% every year and can be modeled as $y = 7500 + 7500rt$, where t represents the number of years that he owns the investment. a. What does the 7500 represent? b. Graph the first equation of $y = 7500(1 + 0.04)^t$ c. Graph the second equation of $y = 7500 + 7500(0.08)t$ which can be written as $y = 7500(1 + 0.08t)$ d. Which function is exponential and which equation is linear? e. Determine the value of each investment in 10 years time. f. Use the table on your TI-84 to determine when the value of each investment has doubled.
37.4	Use your calculator to graph the equation $y = 25(1.5)^x$. Use the graph and your data table on the calculator to answer 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

37.5

Enter the data into your LISTS (STAT EDIT) in the calculator and graph the scatter plots. Then, use the STAT CALC to determine the equation of the curve that best fits through the data.

These tables show the population (in thousands) of two different bacterial colonies growing in separate Petri dishes.

Colony 1:

Time (h)	0	1	2	3	4	5	6	7	8	9	10	11
Population (thousands)	12	19	33	57	85	108	127	142	151	157	160	161

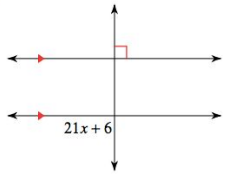
Colony 2:

Time (h)	0	1	2	3	4	5	6	7	8	9	10	11
Population (thousands)	3	6	11	20	36	65	110	190	250	380	590	980

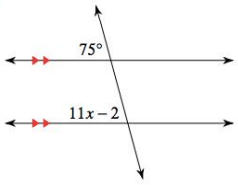
37.6

Solve for the unknowns in the following diagrams:

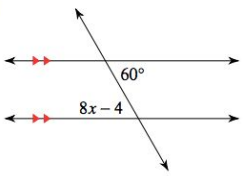
19)



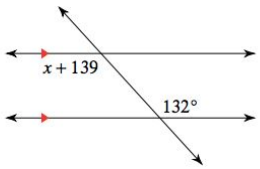
20)



21)



22)



37.7

Two towns have been growing in their populations over the past 20 years. The population of Mathville is modeled by the equation $P(t) = 50\,000 + 2500t$, where t represents the time in years since 2000. The population of Algebratown is modeled by $P(t) = 20\,000(1.05)^t$, where t represents the years since 2000.

a. Graph both equations on your calculator
b. What was the population of Mathville and Algebratown in the year 2000?
c. What was the population of Mathville and Algebratown in the year 2010?
d. What will be the population of Mathville and Algebratown in the year 2030?
e. When will the two towns have the same population?
f. Which town is growing faster? Explain your answer.

37.8

Use your calculator to work through the following questions:

a. Find the value of: (i) $9^{\frac{1}{2}}$ (ii) $16^{\frac{1}{2}}$ (iii) $36^{\frac{1}{2}}$ (iv) $225^{\frac{1}{2}}$ (v) $900^{\frac{1}{2}}$
b. Explain your values and explain what the exponent of ½ means

c. Find the value of: (i) $8^{\frac{1}{3}}$ (ii) $27^{\frac{1}{3}}$ (iii) $125^{\frac{1}{3}}$ (iv) $343^{\frac{1}{3}}$ (v) $1000^{\frac{1}{3}}$
d. Explain your values and explain what the exponent of ⅓ means

e. What would the exponents ¼ and ⅛ then mean?