## IM1 Problem Set 52

## Problem Set 52

| 52.1 | Use your calculator and a standard view window to graph and analyze the following functions: (Your analysis will include $x$ - and $y$-intercepts and vertex and axis of symmetry. <br> a. $y=(x-1)^{2}-2$ <br> b. $y=2(x-1)^{2}-2$ <br> c. $f(x)=3(x-1)^{2}-2$ |
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| 52.2 | Numeracy Skills: Find the two numbers that: <br> a. will add to a sum of 1 and multiply to a product of -6 . <br> b. will add to a sum of 2 and multiply to a product of -8 . <br> c. will add to a sum of 10 and multiply to a product of 21 . <br> d. will add to a sum of -10 and multiply to a product of -24 . <br> e. will add to a sum of -7 and multiply to a product of 12 . <br> f. will add to a sum of 12 and multiply to a product of 36 . <br> g. will add to a sum of 8 and multiply to a product of -48 . <br> h. will add to a sum of 0 and multiply to a product of -16 . <br> i. will add to a sum of 2 and multiply to a product of -80 . |
| 52.3 | A penguin dives into a lake to catch a fish. The underwater path of the penguin is described by the model $d(x)=1 / 2 x^{2}-3 x$, where $x$ represents the horizontal position of the penguin relative to its entry point and $d$ is the depth of the penguin underwater. Both measurements are in meters. <br> a. Graph the parabola on your calculator. State your window settings. <br> b. Explain what the point $(2,-4)$ represents in the context of this problem. <br> c. State the domain and range in the context of this problem. <br> d. What is the greatest depth below the water surface? <br> e. Factor the equation $y=1 / 2 x^{2}-3 x$ in factored form. |
| 52.4 | Expand and simplify the following polynomial expressions: <br> a. (i) $(x+2)(x+2)$ <br> (ii) $(x+3)(x+3)$ <br> b. (i) $(x+5)^{2}$ <br> (ii) $(x-4)^{2}$ |


| 52.5 | For each graph, state the $x$-intercept and then use the $x$-intercepts to determine the equation of the parabola in the form of $y=a(x+\boldsymbol{R})(x-\boldsymbol{S})$ <br> ii) <br> iv) <br> vi) |
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| 52.6 | A company models the profit of its latest video game using the relation $P(x)=-4 x^{2}+20 x-9$, where $x$ is the number of games produced (in hundreds of thousands) and $P$ is the profit in millions of dollars. <br> a. Explain what the point $(5,-9)$ means in the context of this problem. <br> b. Suggest a reasonable domain for this relation, given the context of the problem. <br> c. What are the break even points for the company? <br> d. What is the maximum profit that the company can earn? <br> e. How many games must be produced to earn this maximum profit? <br> f. Rewrite the equation in vertex form. |
| 52.7 | Given the function $y=1 / 2(x-3)^{2}-2$, use your calculator to help answer the following questions about this quadratic relation <br> a. Create a table of values, using the $x$ values of $\{0,1,2,3,4,5,6\}$. <br> b. Determine the equation of the axis of symmetry. <br> c. Find the coordinates of the vertex. <br> d. Find the coordinates of the zeros. <br> e. Find the y-intercepts. <br> f. Determine the maximum OR minimum value. |
| 52.8 | Fun times today and thanks for your participation and efforts in this situation. As requested, I am putting the video of the recorded lesson into our shared google folder $==>$ (address link below) <br> https://drive.google.com/drive/folders/12SwzmIuNrofSFnJxpHtQ67tCcCTp7LSN |

