Practice Problems for Math Success

Quadratic Functions

These **practice problems** are designed to help you **prepare for our course exams** and **assess your understanding** of the course material at the expected level. Aim to complete them **in class, during tutoring, office hours, or on your own**, and try to solve them **without notes or a calculator**, just like on the **actual exams**. Remember, **practice makes perfect**, so don't hesitate to **ask for help** if you get stuck.

1. Find a formula for the quadratic function g with zeros at $x = 1$ and $x = 2$ and vertex $\left(\frac{3}{2}, -1\right)$.

2. Find a formula for the quadratic function h passing through the points $\left(\frac{4}{3}, 0\right), (-2, 0)$ and $(4, -32)$.

3. The number of tickets sold each day, $N(s)$, for an upcoming ballet performance is given by

$$N(s) = -0.4s^2 + 8.8s + 36.6,$$

where s is the number of days since the tickets went on sale.

Note: Problem may require a calculator, but exam questions will not.

(a) find the day on which the most number of tickets was sold and how many tickets were sold on that day.

The day on which the most tickets were sold is _____.
The maximum number of tickets sold on a single day was _____.

(b) Which function has the same maximum as $N(s)$: $N(s-12)$ or $N(s)-12$.

(c) Which function has the greatest number of tickets sold on a single day: $N(s+7)$ or $N(s)+7$.

4. If an astronaut on the moon were to throw a ball upwards, the height, h (in meters), of the ball as a function of the time in the air, t (in seconds), would be given by:

$$h(t) = 4 + 0.72t - 0.08t^2.$$

Note: Problem may require a calculator, but exam questions will not.

(a) What is the initial height of the ball?

(b) What is the maximum height that the ball would reach during its flight?

(c) When will the ball reach the ground?

5. If a football player kicks a ball at an angle of 35.7° above the ground with an initial speed of 20 meters/second, then the height, h, as a function of the horizontal distance travelled, d, is given by

$$h(d) = 0.75d - 0.0192d^2.$$

Note: Problem may require a calculator, but exam questions will not.

(a) When the ball hits the ground, how far is it from the spot where the football player kicked it?

(b) What is the maximum height that the ball reached during its flight?

6. **Extra Credit Question Type on Exam 2**

   Find the formula for the quadratic function f that contains the following points $(2, 10), (0, -8)$ and $(-3, -41)$.