Name: _____ _____ **/ 25**

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. [10 points] Let $P(2,-1)$ be a point on the graph of $f(x)=\dfrac{-5x+6}{x}+1$.

a. Find the **slope of the secant line** passing through P and the point $Q(4,f(4))$.

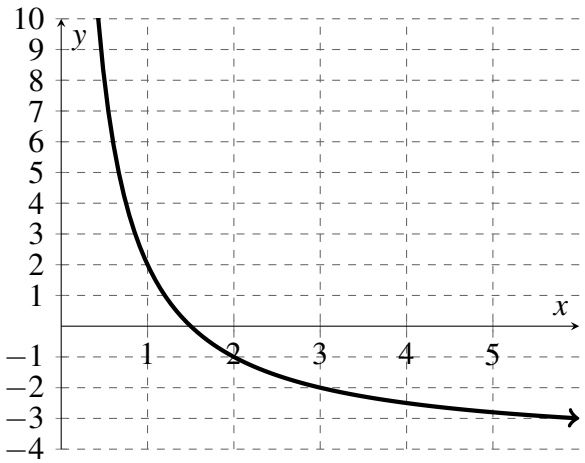
b. The table below lists the slope (m_{sec}) of the secant line passing through the point P and the point $Q(x,f(x))$ for several values of x.

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$	-0.8421	-0.9849	-0.9985	-1.0015	-1.0149	-1.1429
m_{sec}	-1.5789	-1.5075	-1.5008	-1.4993	-1.4925	-1.4286

Use the information in the table to estimate the **slope of the tangent line** to $f(x)$ at the point $P(2,-1)$.

c. Use the slope from part (b) above to write an **equation of the tangent line** at point $P(2,-1)$.

d.



Left is a sketch of the graph of $f(x)=\dfrac{-5x+6}{x}+1$.

Sketch and label the tangent line to the graph at the point $P(2,-1)$.

Sketch and label the secant line between $P(2,-1)$ and $Q(4,f(4))$.

2. [5 points] A barrel going over the edge of Niagara falls has height function $h(t) = 51 - 5t^2$ meters, after t seconds have elapsed. Find the **average velocity** of the barrel between $t = 1$ and $t = 3$ seconds. Simplify and include units with your answer.

3. [8 points] Evaluate the expressions below. Assume all angles are measured in radians.

a. $\sin(3\pi/4) =$

b. $\cot(7\pi/6) =$

c. $\arcsin\left(\cos\left(\dfrac{4\pi}{3}\right)\right) =$

d. $\arctan\left(-\sqrt{3}\right) =$

4. [2 points] Solve the equation $5^{x/3} = \frac{1}{25}$. Give an exact answer.