Name: _____ _____ / **25**

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

1. [11 points] Let $P(1,-2)$ be a point on the graph of $f(x) = 4 - x - \dfrac{10}{x+1}$.

a. Find the slope of the secant line passing through P and the point $Q(0, f(0))$.

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

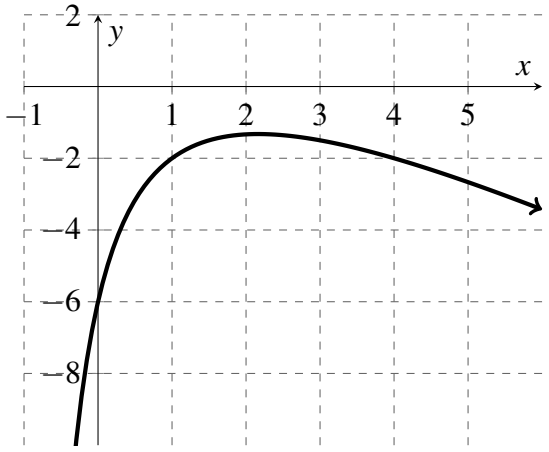
c. The table below lists the slope of the secant line passing through the point P and the point $Q(x, f(x))$ for several values of x.

x	0.9	0.99	0.999	1.001	1.01	1.1
f(x)	-2.1631	-2.0151	-2.0015	-1.9985	-1.98512	-1.86190
m_{sec}	1.53157	1.512562	1.501250	1.498750	1.487562	1.380952

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

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

e.



Left is a sketch of the graph of

$$f(x) = 4 - x - \frac{10}{x+1}.$$

Sketch and label the **tangent** line to the graph at the point $P(1,-2)$.
Sketch and label the **secant** line between $P(1,-2)$ and $Q(4, f(4))$.

2. [8 points] Evaluate the expressions below. Assume all angles are measured in radians.

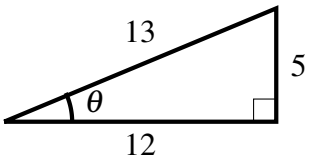
a. $\cos(\pi/4) =$

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

c. $\sin(5\pi/3) =$

d. $\sin(-3\pi/2) =$

3. [2 points] Use the right triangle below, with side lengths 12, 5 and 13, to evaluate the expressions.



a. $\tan(\theta) =$

b. $\sec(\theta) =$

4. [4 points] An athlete is running along a straight path. The position of the athlete is given by $d(t) = t^2 - t$, where t is time measured in seconds and d is distance measured in meters. Find the average velocity of the athlete between $t = 1$ and $t = 4$. Include units with your answer.