Practice Quiz - Mod 8

① using a table find the limit

$$f(x) = \frac{2x^2 - 7x - 4}{x^2 - 16} \quad \frac{(2x+1)\cancel{(x-4)}}{(x+4)\cancel{(x-4)}} \quad \lim_{x \to 4} f(x) = 1.125$$

Hole

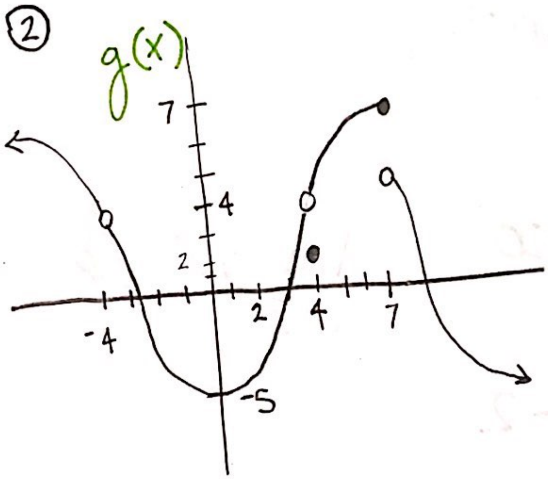
X	Y
3.98	1.122
3.99	1.1239
3.999	1.1248
4	undef.
4.001	1.250
4.01	1.126
4.02	1.127

X	Y
-3.98	-348
-3.99	-698
-3.999	-6998
-4	und
-4.001	70002
-4.01	702
-4.02	352

$\lim_{x \to -4} f(x) =$ Does Not Exist.

vertical asymptote

②



$\lim_{x \to -4} g(x) = 4$ $\quad f(0) = -5$

$\lim_{x \to 7^-} g(x) = 7$ $\quad f(7) = 7$

$\lim_{x \to 7} g(x) = DNE$ $\quad f(-4) =$ undef.

State continuous or non-continuous.
Then state the type and condition that's not met.

At $x = -4$	At $x = 2$	At $x = 7$	At $x = 4$
Not continuous Removable $g(-4)$ is not defined	Continuous	Not Continuous Non-Removable $\lim_{x \to 7} g(x)$ does NOT exist.	Not Continuous Removable $g(4) \neq \lim_{x \to 4} g(x)$ $2 \neq 4$

③ Ms. Shultis is filling up her swimming pool and then realizes there's something in the pool and has to drain it. The level of the water in the pool is represented by $l(t) = -(t-40)^2 + 6$ where t is time in minutes.

ⓐ At what time is the pool empty again?

$0 = -(t-40)^2 + 6$ $\qquad 6 = (t-40)^2 \qquad t = 40 \pm \sqrt{6}$

$\pm\sqrt{6} = t - 40$

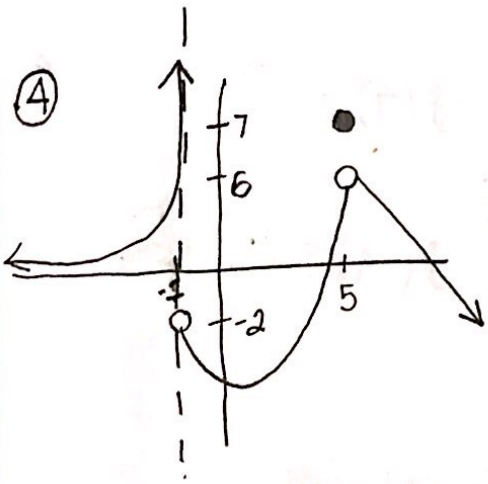
ⓑ What average speed is the pool being filled for the first 10 minutes? Does not make sense in the context of the problem.

$$\frac{l(10) - l(0)}{10 - 0} = 70$$

ⓒ What was the speed exactly 3 minutes before the pool was completely drained? $t = 40 + \sqrt{6} - 3 = 39.45$

$$\lim_{t \to 39.45} \frac{l(t) - l(39.45)}{t - 39.45} = \boxed{1.1005}$$

④



$\lim_{x \to -1^-} f(x) = \infty$

$\lim_{x \to 5} f(x) = 6$

$\lim_{x \to -1^+} f(x) = -2$

$\lim_{x \to -1} f(x) = \text{DNE}$