

Quiz 1

Key

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz.

1. Let $f(x) = x\sqrt{9-x}$.

(a) [1] (WebHW1 #5) Find $f(3+h)$.

$$f(\boxed{}) = \boxed{} \sqrt{9 - \boxed{}}$$

$$\Rightarrow f(\boxed{3+h}) = \boxed{3+h} \sqrt{9 - \boxed{3+h}}$$

So $(3+h)\sqrt{9-(3+h)}$
 parenthesis +1.5
 get it +1.5

(b) [1] (§1.1 #30) Is the point $(-1, -\sqrt{10})$ on the graph of f ? Why or why not?

$$f(-1) = (-1)\sqrt{9-(-1)}$$

$$= -1 \cdot \sqrt{9+1}$$

$$= -1 \cdot \sqrt{10} = -\sqrt{10} \quad (+1.5)$$

yes +1.5

(c) [2] (WebHW1 #9) (Use the domain convention to) Find the domain of f .

stuff in square root ≥ 0 (+1)

$$9-x \geq 0$$

$$9 \geq x$$

$$\text{or } (-\infty, 9]$$

alg +1.5
 get it +1.5

(d) [2] (§1.1 #48) Identify the x intercept(s).

x intercepts happen when $y=0$ (+1.5)

$$0 = x\sqrt{9-x} \quad (+1.5)$$

alg +1.5

both sol +1.5

$$\Leftarrow x=0 \quad \text{or} \quad \Downarrow \sqrt{9-x} = 0$$

$$\Rightarrow x(\sqrt{9-x})^2 = 0^2$$

$$\Rightarrow 9-x = 0$$

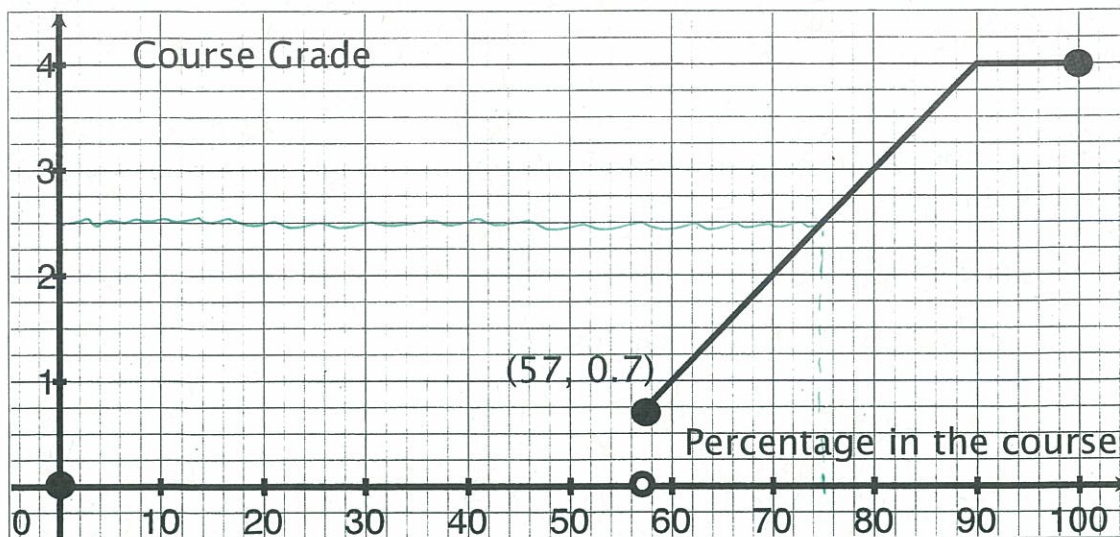
$$\Rightarrow 9 = x$$

so when $x=0$ or 9

or

$(0,0)$ and $(9,0)$

2. Let g be the piecewise defined graph shown below.



(a) [1] (§1.3 #56) Estimate $g(80)$

3.0

(b) [1] (6/23 lecturer) Estimate x such that $g(x) = 2.5$.

75

(c) [2] (6/23 lecturer) What is the range of g ?

$\{0\} \cup [0.7, 4.0]$

y-values (+.5)

and points (+.5)

Note: we can write a rule for the function g ?

$$g(x) = \begin{cases} 0 & \text{if } x < 57 \\ \frac{1}{10}x - 5 & \text{if } 57 \leq x \leq 90 \\ 4.0 & \text{if } 90 < x \end{cases}$$

line connects
 $(70, 2.0)$ and $(80, 3.0)$
 slope = $\frac{3-2}{80-70} = \frac{1}{10}$
 passes thro $(70, 2.0)$ s:
 $2.0 = (\frac{1}{10})(70) + b$
 $\Rightarrow 2.0 = 7 + b$
 $\Rightarrow b = -5$
 so $y = \frac{1}{10}x - 5$