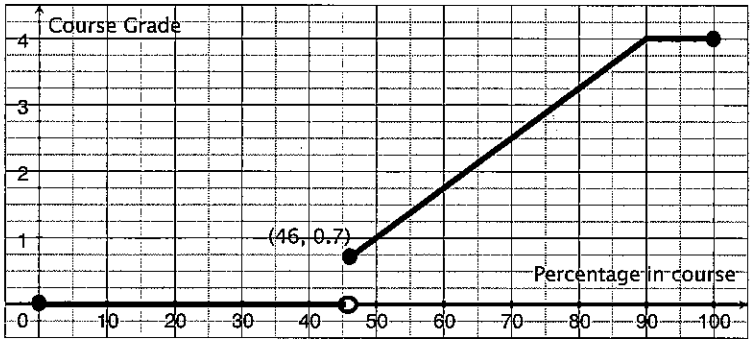
Key

Quiz 1

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

1. Consider the following graph of G.



(a) [1] (§2.2 #26c) Estimate x so that $G(x) = 3.0$.

about 76%

(b) [2] (§2.2 #23b) Find the range of G.

$[.7, 4.0] \cup \{0\}$ (+.5) (+.5) (+.5)

notation to make sense (+.5)

(c) [2] (§2.2 #53) Find a formula for the function G in the indicated form.

$$G(x) = \begin{cases} 0 \text{ (+.5)} & \text{if } 0 \le x < 46 \\ 3.3/44\ x + \_\_\_ & \text{if } 46 \le x < 90 \\ 4.0 \text{ (+.5)} & \text{if } 90 \le x \le 100 \end{cases}$$

points on line (46, .7) and (90, 4.0)

slope: $\frac{4.0 - .7}{90 - 46} = \frac{3.3}{44}$ (+.5) $\Rightarrow y = \frac{3.3}{44}x + b = .075x + b$

through (90, 4.0) so $4.0 = \frac{3.3}{44}(90) + b$ (+.5)

$b = 4 - \frac{3.3}{44}90 \approx -2.75$

2. (§2.1 #32) Let $f(x) = \frac{1}{x+1}$. Find the following:

(a) [1] $f(3) = \frac{1}{3+1} = \frac{1}{4}$

(b) [2] $f(3+h) = \frac{1}{3+h+1} = \frac{1}{4+h}$

recognized denominator +1.5

(c) [2] Use the above work to find the *difference question of f at 3*, that is find:

$$\frac{f(3+h) - f(3)}{h}$$

and simplify.

$$\frac{f(3+h) - f(3)}{h} = \frac{\frac{1}{4+h} - \frac{1}{4}}{h}$$ notation +1

$$= \left[\frac{1}{4+h} - \frac{1}{4}\right] \div h$$

$$= \left[\frac{4-(4+h)}{4(4+h)}\right] \cdot \frac{1}{h}$$

$$= \frac{4-4-h}{4(4+h)} \cdot \frac{1}{h}$$

$$= \frac{-h}{4(4+h)h} = \frac{-1}{4(4+h)}$$ Alg +1