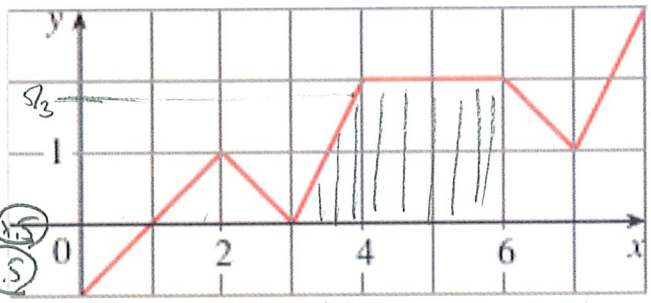
Key

Quiz 9

This is a 2-stage quiz. During the 1st stage, use your knowledge, a one-sided sheet of notes & calculator. You have 15 min. In the 2nd stage, you are now welcome to use your books, notes, and students in the class to retake the same quiz. You have the remainder of the quiz time to write one solution (with everyone's name on it!!!) to be turned in for the group.

Show *all* your work. Reasonable supporting work must be shown for any partial credit.

1. Consider the function f graphed:



(a) [1] Estimate $f(2)$ ≈ 1

(b) [2] Find the average value of f between 3 and 6.

§6.5 #16

limits +.5 int +.5

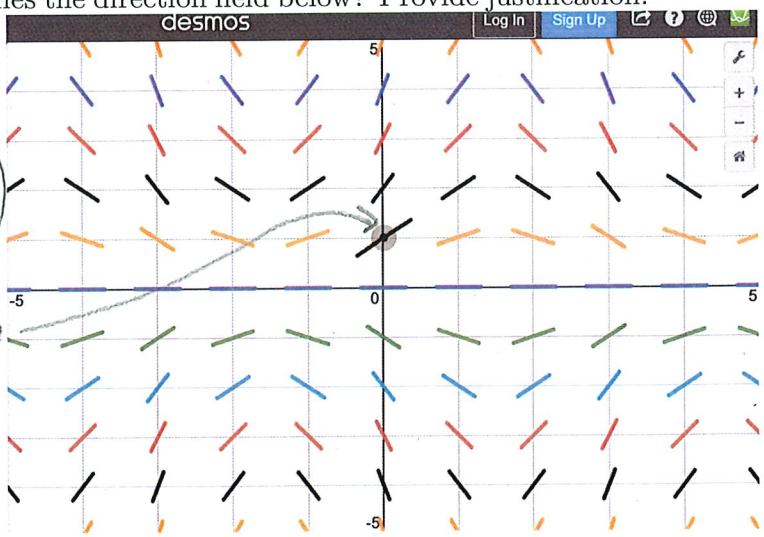
$$\frac{1}{6-3}\int_3^6 f(x)\,dx \quad (+.5)$$

$$\frac{1}{3}\left(\frac{1}{2}(1)(2)+2\cdot 2\right) = \frac{1}{3}(1+4) = \frac{5}{3} \quad (+.5)$$

(c) [1] Estimate x where $f(x)$ equaled the average value between 3 and 6.

re estimate x so $f(x) = 5/3$ (+.5) about 3.9 (+.5)

2. [3] Which differential equation matches the direction field below? Provide justification.



plug in pt +.5
justification +1
slope ready +.5

(a) ~~$\frac{dy}{dx} = y\sin\left(\frac{\pi x}{3}\right)$~~

@ (0,1) $\left.\frac{dy}{dx}\right|_{(0,1)} = 1\sin(0)$

$= 0$

@ (0,1) field has positive slope

Worth 1 * 8

(+1) (b) $\frac{dy}{dx} = y\cos\left(\frac{\pi x}{3}\right)$

@ (0,1) $\left.\frac{dy}{dx}\right|_{(0,1)} = 1\cdot\cos(0)$

$= 1$

3. [3] Write a differential equation that models the given situation.
The rate an object cools is proportional to the difference in temperature between that object T and the ambient temperature A.

DE key

$$\frac{dT}{dt} = k(T-A) \quad (+.5)\ (+.5)\ (+1)$$

got it (+1)