

# Quiz 1 (PM)

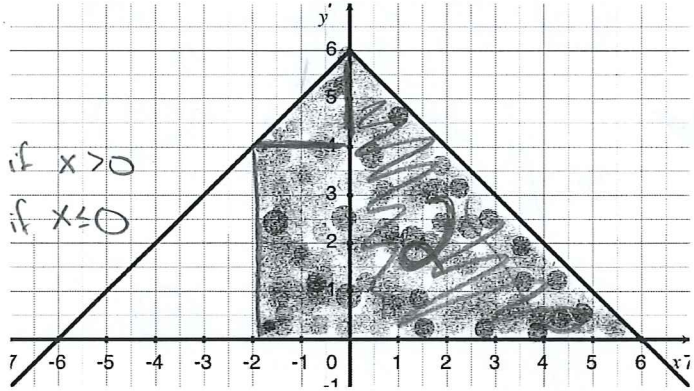
Key

Show *all* your work. Reasonable supporting work must be shown to earn credit. There are *two* sides to this quiz.

1. Consider the graph below for the following questions.

(a) [1] Find the rule/expression of the function

$$f(x) = |x| + 6 \quad \text{or} \quad f(x) = \begin{cases} -x + 6 & \text{if } x > 0 \\ x + 6 & \text{if } x \leq 0 \end{cases}$$



(b) [3] (WebHW2 #1) Set up a definite integral that yields the area of the shaded region.

$$\int_{-2}^6 f(x) dx \quad \text{or} \quad \int_{-2}^6 -|x| + 6 dx$$

limits (+1)

dx (+5)

correct placement (+.5)

f(x) notation (+1)

(c) [2] (§5.3 #52a) Compute/find the definite integral that you set up above.

$$\begin{aligned} &\text{triangle 1} + \text{rectangle} + \text{(big) triangle 2} \\ &\frac{1}{2} \cdot 2 \cdot 2 + 2 \cdot 4 + \frac{1}{2} \cdot 6 \cdot 6 \\ &2 + 8 + 18 \end{aligned}$$

note there are lots of ways to compute the shaded area

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area (+.5) broke into areas concept (+.5)  
formula for  $\Delta$  or rect (+.5)  
computations (+.5)

if try to use FTC (+.5)  
try antider (+.5)  
get antider (+.5)  
plug in values (+.5)

2. [4] (definiteActivity #3) Given  $\int_2^4 g(x) dx = 25$ ,  $\int_2^4 x dx = 6$ , and  $\int_0^2 x dx = 2$ , find:

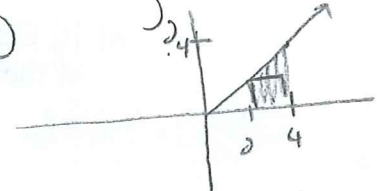
(a)  $\int_2^4 2g(x) - x dx$

(+5)  $= \int_2^4 2g(x) dx - \int_2^4 x dx$

(+5)  $= 2 \int_2^4 g(x) dx - \int_2^4 x dx$   
 $= 2(25) - 6 = (44)$

(+5) Answer

or  $= \int_2^4 2g(x) dx - \int_2^4 x dx$  (+5)  
 $= 2 \int_2^4 g(x) dx - \int_2^4 x dx$   
 $= 2(25) - 6 = 44$



(+5)  $\frac{1}{2} \cdot 2 \cdot 2 + 2 \cdot 2 = 6$   
 $= 2(25) - 6 = 44$

(b)  $\int_0^4 x dx$

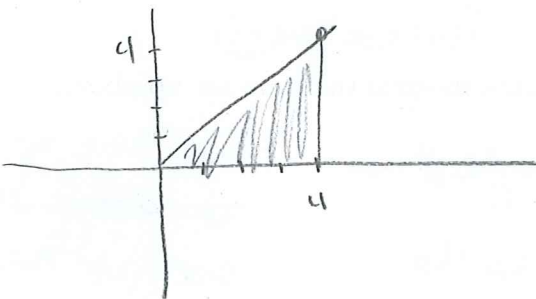
$= \int_0^2 x dx + \int_2^4 x dx$  (+1)

$= 2 + 6$

$= 8$

(+5) Answer

or



$\frac{1}{2} (4 \cdot 4) = 8$