Name:_____

AP Calculus AB Exam 2 Quarter 3

Mar
Ms.

Please answer all questions and show any and all work ***clearly and neat*** appropriate spaces provided. Partial credit will be awarded on questions appropriate. There will be no partial credit on questions 1 through 6. A with no work or incorrect supporting work will receive 1 point. **The use *is not* permitted**. Good luck!

$\frac{1}{2}(2)[0+2(1)+2(2.25)+6.25]$

$2 + 4.5 + 6.25$

1.

x	0	2	4	6
$f(x)$	0	1	2.25	6.25

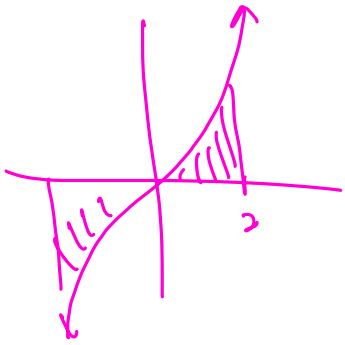
The function f is continuous on the closed interval [0,6] and has values th the above table. Using the subintervals [0,2], [2,4], and [4,6], what is the approximation of $\int_0^6 f(x)\,dx$?

$\frac{1}{2}(2)(0+2(1)+2(2.25)+6.25)$

$0+2+4.50+$

③ $\int_k^2 t^3\,dt = 0$ ← odd function

$k = \pm 2$



⑦ $\frac{dy}{dx} = 2xy$ if $y=4$ when $x=0$, $y=$

$\int \frac{dy}{y} = \int 2x\,dx$

$\ln|y| = x^2 + C$ (0,4)

$\ln 4 = C$

$\ln|y| = x^2 + \ln 4$

$e^{\ln|y|} = e^{x^2+\ln 4}$

$|y| = e^{x^2} \cdot e^{\ln 4}$

$|y| = 4e^{x^2}$

$y = \pm 4e^x$

(8) $\int_{-2}^{2} (x^7 + k)\,dx = 16$ $\quad k = ?$

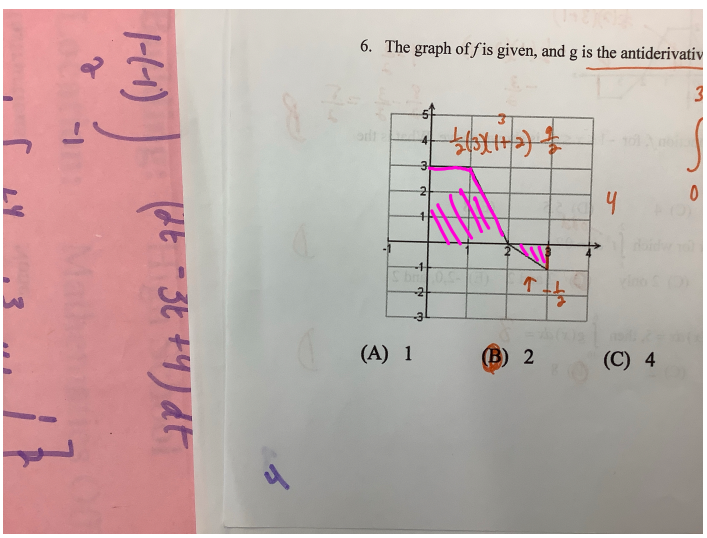
$$\frac{x^8}{8} + kx \Big|_{-2}^{2} = 16$$

$$\frac{2^8}{8} + 2k - \left(\frac{(-2)^8}{8} - 2k\right) = 16$$

$$4k = 16$$

$$k = 4$$

(6)



$g = \int f$

$g' = f$

$$\int_0^3 g'(x)\,dx = g(3) - g(0)$$

$$4 = 6 - g(0)$$

$$-2 = -g(0)$$

$$2 = g(0)$$

(10) $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{\sec^2 x}{\tan x}\,dx$

$u = \tan x$

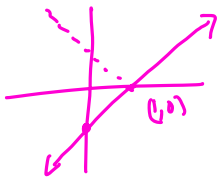
$du = \sec^2 x\,dx$

$$\int_{\tan\frac{\pi}{4}}^{\tan\frac{\pi}{3}} u^{-1}\,du$$

$$\int_1^{\sqrt{3}} u^{-1}\,du = |\ln|u||_1^{\sqrt{3}} = \ln\sqrt{3} - \ln 1$$

$\ln\sqrt{3} \approx \frac{1}{2}\ln 3$

(11) $\int_{-3}^{5} |x-1|\,dx =$

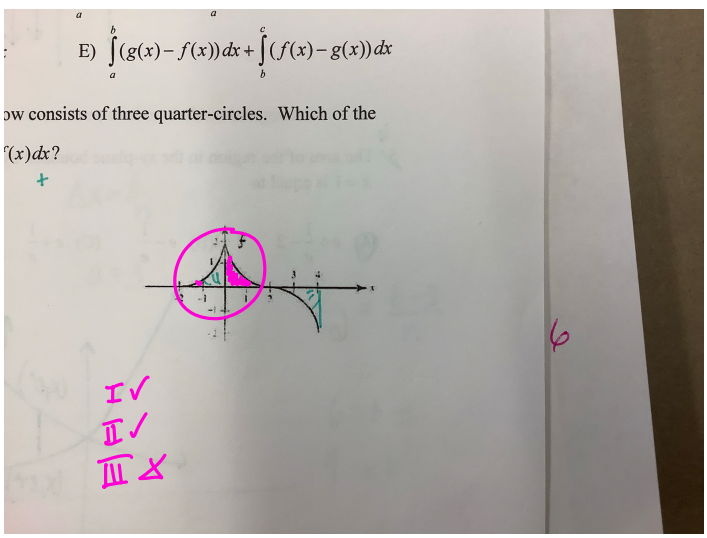


$$-\int_{-3}^{1}(x-1)dx + \int_{1}^{5}(x-1)dx$$

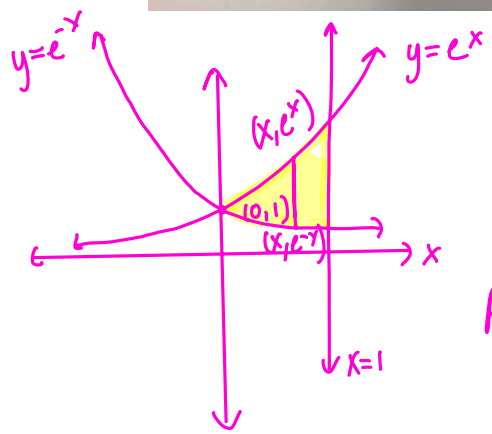
$$\int_{-3}^{1}(x-1)dx + \int_{1}^{5}(x-1)dx$$

$$\frac{x^2}{2} - x\Big|_{-3}^{1} + \frac{x^2}{2} - x\Big|_{1}^{5}$$

Exam 3



(6)



$$A = \int_0^1 (e^x - e^{-x})\,dx$$

$$e^x + e^{-x}\Big|_0^1$$

$$e^1 + e^{-1} - (e^0 + e^0)$$

$$e + \frac{1}{e} - 2$$

$$\int e^{-x}\,dx$$

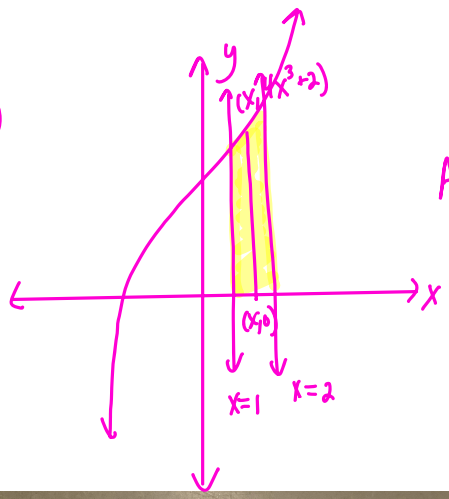
$u = -x$

$du = -dx$

$$-\int e^u\,du = -e^u + c$$

$$-e^{-x} + c$$

⑤

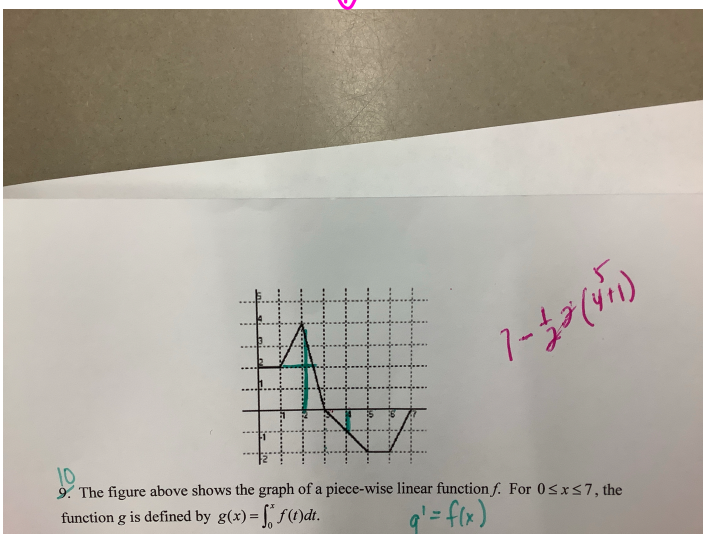


$$A = \int_1^2 (4x^3+2)\,dx$$

$$x^4+2x \Big|_1^2$$

$$2^4+2(2) - (1^4+2(1))$$

$$17$$



9. The figure above shows the graph of a piece-wise linear function f. For $0 \le x \le 7$, the function g is defined by $g(x) = \int_0^x f(t)\,dt$.

$g' = f(x)$

$7 - \frac{1}{2}(4+1)$

⑩ c)

$$g(0) = \int_0^0 f(t)\,dt = 0$$

$$g(3) = \int_0^3 f(t)\,dt = 2(2) + \frac{1}{2}(1)(2) + \frac{1}{2}(1)(4) = 4 + 1 + 2 = 7$$

$$g(7) = \int_0^7 f(t)\,dt = 7 - \frac{1}{2}(2)(1+4) = 2$$

abs max 7

Why can't you do $\int_0^3 g'(x)\,dx = g(3) - g(0)$

b/c you do not have $g(3)$ or $g(0)$ you have the graph of g' not g so you would still need to use integrals to find $g(3)$ and $g(0)$