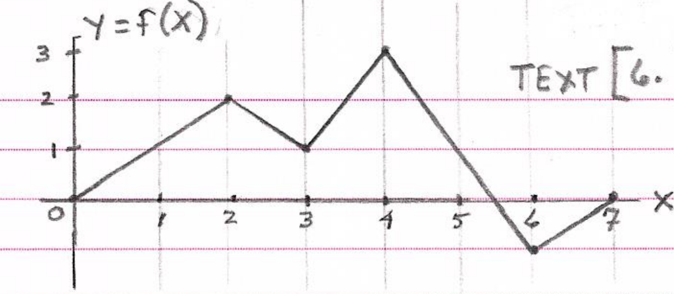
[6.1] #16 TEXT [6.1]: 16, 28

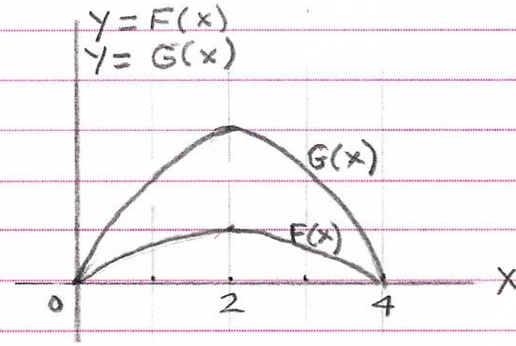


(a) $f(3)=1 \quad f(7)=0$

(b) $f(0)=0 \quad \therefore x=0$

$f(7)=0 \quad \therefore x=7$

#28



$F(0)=0$

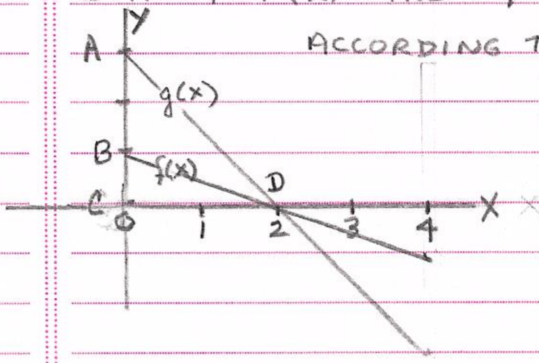
$G(0)=0$

$F(4)=0$

$G(4)=0$

GIVEN:

BOTH $Y=F(X)$ AND $Y=G(X)$ HAVE A LOCAL MAX AT $X=2$.



ACCORDING TO THE GIVEN GRAPH,

THE AREA OF Δ ACD $\approx \frac{1}{2}\cdot 2\cdot 3 = 3$

THE AREA OF Δ BCD $\approx \frac{1}{2}\cdot 2\cdot 1 = 1$

$\therefore G(0) \approx 3\cdot F(0)$

"$\approx$" IS USED BECAUSE WE DON'T HAVE UNITS ON THE Y AXIS, BUT IT APPEARS THAT $g(0) \cong 3\cdot f(0)$.

BOTH $G(x)$ AND $F(x)$ HAVE A LOCAL MAX AT $x=2$.
$G(2)$ IS APPROXIMATELY $3\cdot F(2)$.

[6.2]

TEXT [6.2]: 42, 58, 70

(42) $\int (4e^x - 3\sin x)\,dx = \boxed{4e^x + 3\cos x + C}$

(58) $\int_1^2 \frac{1+y^2}{y}\,dy = \int_1^2 \frac{1}{y} + y\,dx$

$= \ln|y| + \frac{1}{2}y^2\Big]_1^2$

$= \left(\ln 2 + \frac{1}{2}(2)^2\right) - \left(\ln 1 + \frac{1}{2}\cdot 1^2\right)$

$= \ln 2 + 2 - 0 - \frac{1}{2}$

$= \boxed{\ln 2 + \frac{3}{2}}$

2.193

(70) $y_1 = e^x - 2$ on $[0, 2]$ $\quad \int_0^2 e^x - 2 - 0\,dx$ = AREA

$y_2 = 0$ (X-AXIS)

$y_1(0) = e^0 - 2 = -1$ $\quad = e^x - 2x\Big]_0^2$

$y_1(2) = e^2 - 2$ $\quad = (e^2 - 4) - (e^0 - 0)$

$\boxed{\text{AREA} = e^2 - 5}$

2.389

$e^x - 2 = 0$

$e^x = 2$

$x = \ln 2$

$-\int_0^{\ln 2} (e^x - 2)\,dx + \int_{\ln 2}^2 (e^x - 2)\,dx$

$-\left[e^x - 2x\right]_0^{\ln 2} + \left[e^x - 2x\right]_{\ln 2}^2$

$-\left[2 - 2\ln 2 - (\overbrace{e^0 - 2\cdot 0}^{1-0})\right]$

$-\left[1 - 2\ln 2\right] + \left[e^2 - 4 - (e^{\ln 2} - 2\ln 2)\right]$

$-1 + 2\ln 2 + e^2 - 4 - 2 + 2\ln 2$

$-7 + 4\ln 2 + e^2$

greenroom

TEXT [6.3]: 18, 20

$\boxed{18}$ $MC = 3q^2 + 6q + 9$

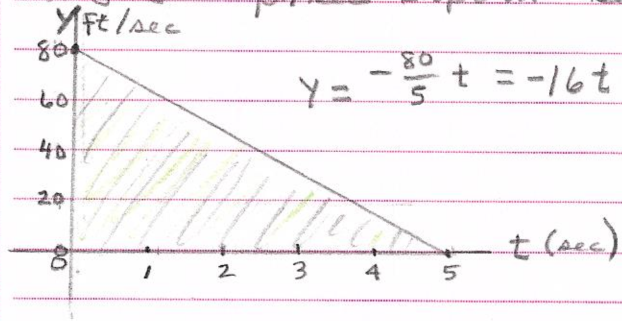
(a) $MC = q^3 + 3q^2 + 9q + K$

(b) TOTAL $C = q^3 + 3q^2 + 9q + 400$

$\boxed{20}$ Car going 80 ft/sec stops in 5 sec.

(a)

(b)



$y = -\frac{80}{5}t = -16t$

(c) AREA $= \frac{1}{2} \cdot 5 \cdot 80 = 200$ FT

(d) $\int_0^5 -16t + 80 \, dt$

$= -8t^2 + 80t \Big]_0^5$

$= -8(25) + 80(5) - 0$

$= -200 + 400$

$= 200$ FT

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