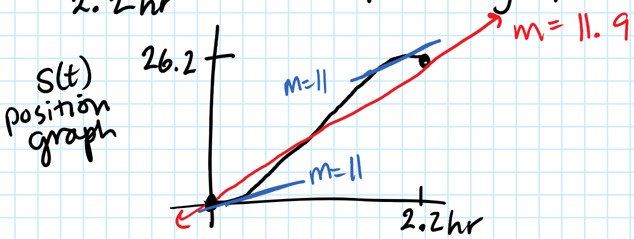
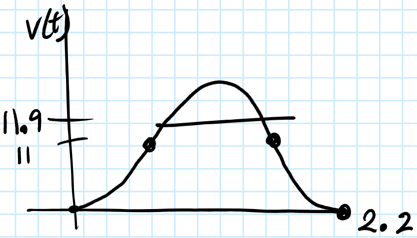
HW 4.2 p. 202 14, 31-33, 36, 38, 40, 51-56

Wednesday, November 12, 2014 2:18 PM

⑭ $\frac{26.2 \text{ mi}}{2.2 \text{ hr}} = 11.9$ mph = avg speed





(31) $f'(x) = 3x^2 - 2x + 1$

$f(x) = x^3 - x^2 + x + C$

(32) $f'(x) = \sin x$

$f(x) = -\cos x + C$

(33) $f'(x) = e^x$

$f(x) = e^x + C$

(36) $f'(x) = \frac{1}{4x^{3/4}}$; $P(1,-2)$

$= \frac{1}{4} x^{-3/4}$

$f(x) = x^{\frac{1}{4}} + C$

$-2 = 1^{1/4} + C$

$-2 = 1 + C$

$-3 = C$

$\boxed{f(x) = x^{\frac{1}{4}} - 3}$

(38) $f'(x) = 2x + 1 - \cos x$ $P(0,3)$

$f(x) = x^2 + x - \sin x + C$

$3 = 0^2 + 0 - \sin 0 + C$

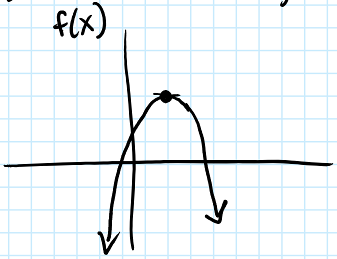
$3 = C$

$\boxed{f(x) = x^2 + x - \sin x + 3}$

(40) $f(2) = 3$ $f'(2) = 0$

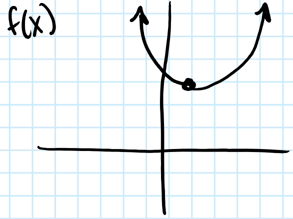
ⓐ $f'(x) > 0$ for $x < 2$, $f'(x) < 0$ for $x > 2$

pos NEG

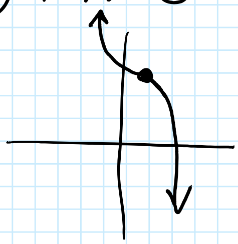


ⓑ $f'(x) < 0$ for $x < 2$, $f'(x) > 0$ for $x > 2$

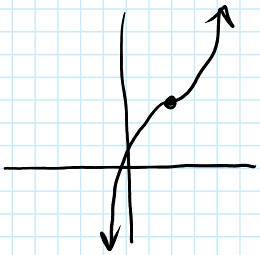
NEG Pos



ⓒ $f'(x) < 0$ for $x \neq 2$



ⓓ $f'(x) > 0$ for $x \neq 2$



(51) False. $f'(x)$ can $=0$ in interval
and $f(x)$ could still be "increasing ex. $f(x)=x^3$

(52) True. If $f'(x)>0$ for (a,b), $f(x)$ is increasing for $[a,b]$

(53) $f(x)=\cos x$ $\quad [0,\frac{\pi}{3}]$

$f(0)=1$
$f(\frac{\pi}{3})=\frac{1}{2}$

avg: $\frac{\frac{1}{2}-1}{\frac{\pi}{3}-0}=\frac{-\frac{1}{2}}{\frac{\pi}{3}}=-\frac{3}{2\pi}$ Ⓐ

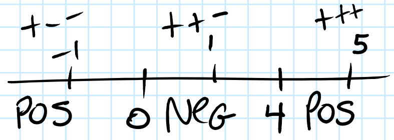
(54) $g(x)=e^{x^3-6x^2+8}$ No domain Rest.

$g'(x)=e^{x^3-6x^2+8}(3x^2-12x)$

g' always defined

$g'=0:\quad e^{x^3-6x^2+8}(3x^2-12x)=0$

$e^{x^3-6x^2+8}=0$ $\quad 3x^2-12x=0$
Never $\quad 3x(x-4)=0$
$x=0,4$



Decreasing $[0,4]$ bc $g'(x)<0$ on $(0,4)$

Ⓑ

(55) $f'(x)=\frac{1}{\sqrt{x}}=(x)^{-\frac{1}{2}}$

$f(x)=2x^{\frac{1}{2}}+C$
$=2\sqrt{x}+C$ Ⓔ

(56) D (Vertical Tangent: Not diff at $x=0$)