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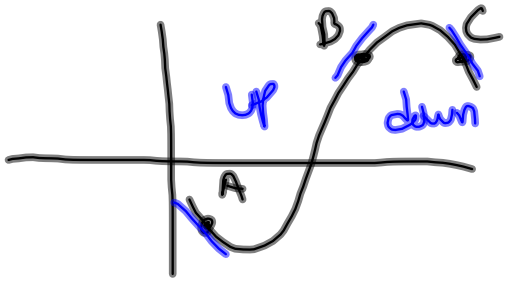
3)



	A	B	C
$\frac{dy}{dx}$	−	+	−
$\frac{d^2y}{dx^2}$	+	−	−

5) You are looking at $f''(x)$, not $f(x)$

when $f''(x)=0$ $(-1, 0, 1, 2)$ $f(x)$ has an inflection point.

7) a) $[4,6]$

b) $[1,4], [6,7]$

c) $(1,2), (3,5)$

d) $(2,3), (5,7)$

e) $x = 2, 3, 5$

12) $5 + 12x - x^3 = f(x)$

$f'(x) = 12 - 3x^2 = 0$ when $x = \pm 2$

$f''(x) = -6x = 0$ when $x = 0$

	$x < -2$	$-2 < x < 0$	$0 < x < 2$	$x > 2$
$f'(x)$	−	+	+	−
$f''(x)$	+	+	−	−

a) inc $[-2, 2]$

b) dec $(-\infty, -2]$, $[2, +\infty)$

c) $(-\infty, 0)$

d) $(0, +\infty)$

e) $x = 0$

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$f(x) = 1 - 4x - x^2$

$f'(x) = -4 - 2x$

$f''(x) = -2$

$f'(x) = 0$

$-4 - 2x = 0$

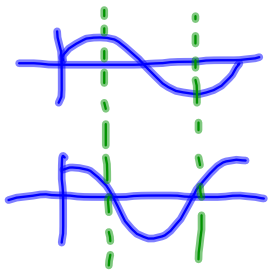
$-2x = 4$

$x = -2$

$f''(-2) = -2$ | concave down

max

19) $f(x) = \sin^2 x \qquad 0 < x < 2\pi$



$f'(x) = 2\sin x \cos x$

$f''(x) = 2\sin x(-\sin x) + \cos x(2\cos x)$

$= -2\sin^2 x + 2\cos^2 x$

$= -2(\sin^2 x - \cos^2 x)$

$f''(\pi) = 2\ (+)$

$f''\left(\frac{\pi}{2}\right) = -2\ (-)$

$f''\left(\frac{3\pi}{2}\right) = -2\ (-)$

$f'(x) = 0 = 2\sin x \cos x$

$\sin x = 0$ or $\cos x = 0$

$x = \pi$ min

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ 2 maxs