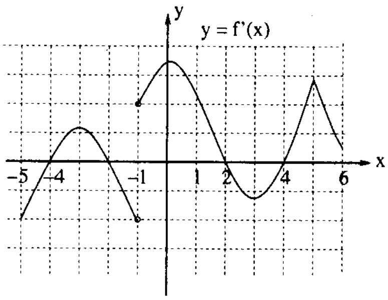
8. (10 pts) f is a continuous function and the graph of its derivative f' is shown below.



$f' = 0$ at $-4, -2, 2, 4$
min max min

$f'' > 0 \Leftrightarrow f'$ increasing

(a) Find all points in the interval (-5,6) at which f has a local maximum.

loc. max @ $x = -2, 2$

(b) Find all points in the interval (-5,6) at which f has a local minimum.

local min @ $x = -4, 4, -1$

b/c f is decreasing to left and increasing to right

(c) Find the intervals in (-5,6) on which f is concave up.

$[-5,-3], \; [-1,0], \; [3,5]$

9. (15 pts) Given the equation $y^3 - xy = 2$

(a) Find $\frac{dy}{dx}$

$$3y^2 \cdot y' - y - xy' = 0$$
$$y'(3y^2 - x) = y$$
$$y' = \frac{y}{3y^2 - x}$$

(b) Is there a point (x_0, y_0) where the tangent to the curve is horizontal (i.e. parallel to the x-axis? If so, find one. If not, explain why not.

tangent horizontal $\Leftrightarrow y' = 0 \Leftrightarrow y = 0$

however, there are no pnts on the curve satisfying $y = 0$.

(c) Show that the point (3,2) lies on the curve and find the equation of the tangent line to the curve at (3,2).

$2^3 - 3 \cdot 2 = 8 - 6 = 2$ ✓

eqn of tangent line: $y - 2 = (y')(x - 3)$; $y' = \frac{2}{3 \cdot 4 - 3} = \frac{2}{9}$

so $y - 2 = \frac{2}{9}(x - 3)$ or

$2 - \frac{2}{3} = \frac{4}{3}$

$$y = \frac{2}{9}x + \frac{4}{3}$$