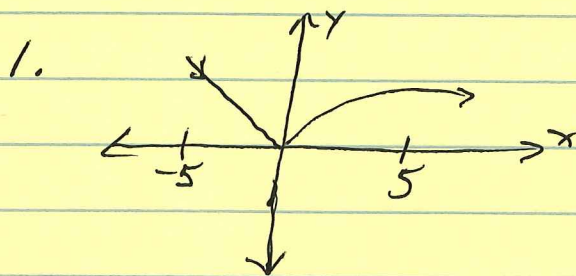
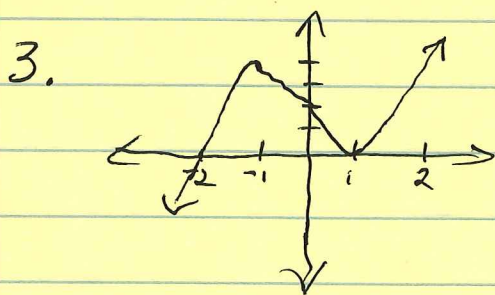


4.1 Pg. 264 (1, 3, 15, 16, 18, 21, 25, 40)

- Intervals Where a Function is Increasing or Decreasing
- Finding relative maxima and relative minima and critical numbers



$(-\infty, 0)$ f is decreasing
 $(0, +\infty)$ f is increasing



$(-\infty, -1)$ f is increasing
 $(-1, +1)$ f is decreasing
 $(+1, +\infty)$ f is increasing

note: $y = mx + b$, slope is +3

15. $f(x) = 3x + 5$
 $f'(x) = 3$

f is increasing on $(-\infty, \infty)$

$3 \neq 0$ No critical points.

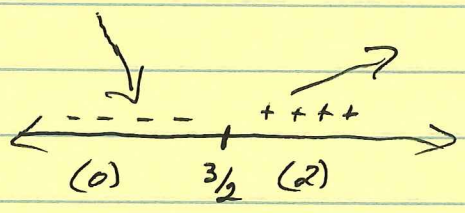
16. $f(x) = x^2 - 3x$

$f'(x) = 2x - 3$

$2x - 3 = 0$

$2x = 3$

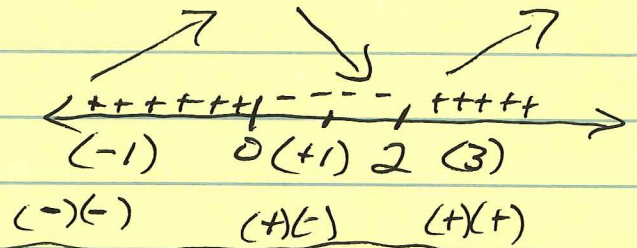
$x = 3/2$ critical point



$(-\infty, 3/2)$ f is decreasing
 $(3/2, +\infty)$ f is increasing

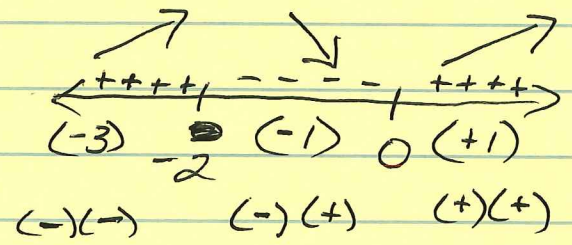
4.1 Pg. 264 cont. (18, 21, 25, 40)

18. $f(x) = x^3 - 3x^2$
 $f'(x) = 3x^2 - 6x$
 $3x(x-2) = 0$
 $x=0 \quad x=2$
 critical points



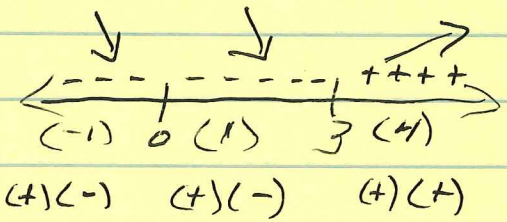
$(-\infty, 0)$ f is increasing
 $(0, 2)$ f is decreasing
 $(2, +\infty)$ f is increasing

21. $g(x) = x^3 + 3x^2 + 1$
 $g'(x) = 3x^2 + 6x$
 $3x(x+2) = 0$
 $x=0 \quad x=-2$
 critical points

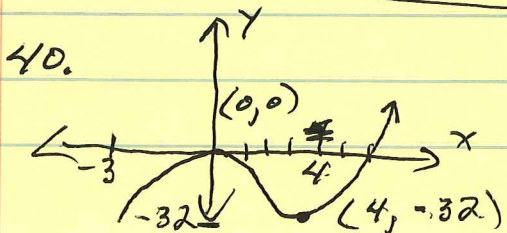


$(-\infty, -2)$ f is increasing
 $(-2, 0)$ f is decreasing
 $(0, +\infty)$ f is increasing

25. $h(x) = x^4 - 4x^3 + 10$
 $h'(x) = 4x^3 - 12x^2$
 $4x^2(x-3) = 0$
 $x=0 \quad x=3$
 critical pts.



$(-\infty, 0)$ f is decreasing
 $(0, 3)$ f is decreasing
 $(3, +\infty)$ f is increasing



relative maxima $(0, 0)$
 relative minima $(4, -32)$