Derivative Properties by Kyle Broughton

IF	THEN
$f'(x) > 0$	f(x) is increasing
$f'(x) < 0$	f(x) is decreasing
f'(x) is increasing	f(x) is concave up
f'(x) is decreasing	f(x) is concave down
f'(x) has a max or min	f(x) has a POI
$f'(x) = 0$ or D.N.E.	f(x) has a critical point
f'(x) changes from + to -	f(x) has a max
f'(x) changes from - to +	f(x) has a min
$f''(x) > 0$	f(x) is concave up
$f''(x) < 0$	f(x) is concave down
$f''(x) = 0$ and changes signs	f(x) has a POI
$f'(x) = 0$ AND $f'' < 0$	f(x) has a max
$f'(x) = 0$ AND $f'' > 0$	f(x) has a min

Therefore

$f'(x) > 0$ AND $f'' > 0$	f(x) is increasing & concave up
$f'(x) > 0$ AND $f'' < 0$	f(x) is increasing & concave down
$f'(x) < 0$ AND $f'' > 0$	f(x) is decreasing & concave up
$f'(x) < 0$ AND $f'' < 0$	f(x) is decreasing & concave down