Calculus Worksheet #5 Unit 1 Selected Solutions

Find all stationary points for each of the following functions. Use values of f(x), the function itself, to classify each as a maximum, a minimum, or neither. Show your work and your answers neatly organized.

2. $y = f(x) = x^3 + 6x^2 - 2$

$f'(x) = 3x^2 + 12x$

$3x^2 + 12x = 0$

$3x(x + 4) = 0$

$x = 0$ or $x = -4$

x	f(x)	
-5	23	
-4	30	← maximum
-1	3	
0	-2	← minimum
1	5	

f(-4) = 30 is a relative maximum.

f(0) = -2 is a relative minimum.

Find all stationary points for each of the following functions. Use values of f '(x), the slope, to classify each as a maximum, a minimum, or neither. Show your work and your answers neatly organized.

7. $y = f(x) = -4x^3 + 21x^2 + 24x$

$f'(x) = -12x^2 + 42x + 24$

$-12x^2 + 42x + 24 = 0$

$2x^2 - 7x - 4 = 0$

$(2x + 1)(x - 4) = 0$

$x = -1/2$ or $x = 4$

x	f(x)	f '(x)	
-1		-30	
-1/2	-6.25	0	← minimum
0		+24	
4	176	0	← maximum
5		-66	

f(-1/2) = -6.25 is a relative minimum.

f(4) = 176 is a relative maximum.