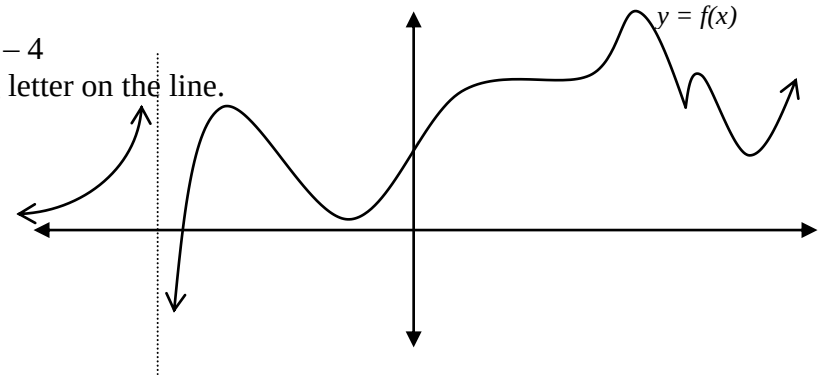
Part A: Knowledge and Understanding. Mark_____/



Use the graph y = f(x) to answer questions 1 – 4

1. For each section place the corresponding letter on the line.
   A) = 0 B) < 0 C) > 0 D) undefined
   a) f(6) _____
   b) f(-4) _____
   c) $f'(2)$ _____
   d) $f'(8)$ _____
   e) $f''(-5)$ _____
   f) $f''(2)$ _____
2. State the value(s) of **a** (an integer) if:
   a) $f(a) < 0$, $f'(a) > 0$ and $f''(a) < 0$ _____
   b) $f(a) > 0$, $f'(a) > 0$, and $f''(a) = 0$ _____
3. On the interval [-8, 8], in how many places is $f'(x)$ undefined? _____
4. On the interval [-8, 8], what is the largest interval of increase? _____
5. a) Sketch g(x) in the neighbourhood of x = 4, if g(4) = 2, $g'(4) = 1$, & $g''(4) = 0$.
   b) Sketch h(x) around x = 1, if h(1) = 1, $h'(1) = -1$ and $h''(1) < 0$.
6. Is the stationary point x = -2, of the function $f(x) = x^4 - 8x^2$ a local max, a local min or a point of inflection? [2]
7. If (-3, 6) is a point on an even function, give another point on the function. _____
8. What is the y-intercept of an odd function with no discontinuities? _____
9. Determine the intercepts, local maximums and minimums, and points of inflection of the curve $y = 10x^3 - 3x^2$. Use the points to sketch the curve. [7]

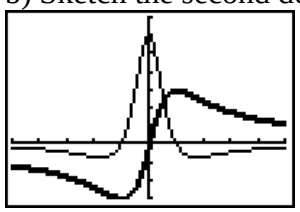
APPS

1. Analyze the curve $f(x) = \frac{5x}{1+x}$ under the seven headings. Then sketch the curve.

(Domain-Intercepts-Symmetry-Asymptotes-Inc/Dec-Max/Min-Concavity)

Communication Level_____

1. Explain what each of these symbolic statements says about the graph of f(x). Then sketch **one function** that satisfies each of the 5 conditions. The first is done for you.
   a) Domain = $\{x \mid x \in \Re\}$ and f(x) is continuous. The function has no breaks.
   b) f(-x) = f(x) _____
   b) f(1) = 3, $f'(1) = 0$ _____
   c) $f''(x) < 0$, $0 < x < 3$, and $f''(x) > 0$, $x > 3$ _____
   d) $\lim_{x \to \infty} f(x) = -2$ _____
2. a) Which is the function and which is the derivative? Explain.
   b) Sketch the second derivative f'' on the empty grid.



TIPS : Level :_____

1. The function $y = ax^4 + bx^2 + c$ has slope -16 at its point of inflection (1, -5). Determine the values of a, b, and c.