

1. (3 points each. No partial credit.) The questions on this page are multiple choice. They do not require an explanation. For each question, circle your choice for the correct answer(s). There may be more than one correct choice. Circle **ALL** answers that *must* be true about the given statement.

(a) The function $h(x) = \frac{x^5 - x^3 + 2x^2}{x^3 - 3x^2}$

- (i) is undefined for $x = 0$ and $x = 3$.
- (ii) has a horizontal asymptote of $y = -2/3$.
- (iii) has vertical asymptotes at $x = 0$ and $x = 3$.
- (iv) approaches $-\infty$ as x approaches ∞ .
- (v) has a horizontal asymptote of $y = 1$.

(b) If a function f is continuous at $x = a$, then

- (i) $\lim_{x \rightarrow a} f(x)$ exists.
- (ii) $\lim_{x \rightarrow a} f(x) = f(a)$.
- (iii) $\lim_{x \rightarrow a} f(x) = f'(a)$.
- (iv) f is differentiable at $x = a$.
- (v) none of (i)-(iv) *must* be true.

(c) If $\lim_{x \rightarrow 3} g(x) = 5$ for some function g , then

- (i) $g(3) = 5$.
- (ii) g is continuous at $x = 3$.
- (iii) $\lim_{x \rightarrow 3^-} g(x) = \lim_{x \rightarrow 3^+} g(x)$.
- (iv) $g'(3) = 5$.
- (v) g is differentiable at $x = 3$.