

(1.) (2 pts each) **True / False**--Circle your choice. Circle **T** only if the statement is *always* true.
[No explanation necessary.]

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|---|----------|----------|
| (a) If a function is differentiable, then it is continuous. | T | F |
| (b) If a function is continuous, then it is differentiable. | T | F |
| (c) If $f'(x)$ is increasing, then f is concave up. | T | F |
| (d) If $f''(x) = -3$, then f is decreasing. | T | F |
| (e) If f has a critical point at $x=3$, then f has a local maximum or a local minimum at $x=3$. | T | F |

(2.) Given :

$r(2) = 2$	and	$s(2) = 1$
$r(4) = -1$		$s(4) = 2$
$r'(2) = 5$		$s'(2) = 3$
$r'(4) = -3$		$s'(4) = 4$

Determine the values indicated below **or** state clearly what information is needed (and not supplied) to determine the requested value. In each case, first determine a general formula for the derivative function and then find the requested value (if possible). [Circle your answers.]

(3 pts each) Find:

(a) $H'(2)$ if $H(x) = \ln(r(x))$

(b) $H'(2)$ if $H(x) = \frac{s(x)}{r(x)}$

(c) $H'(2)$ if $H(x) = \sqrt{s(x)}$