

3. (3 pts each—no partial credit) The following problems are to be considered independent of each other. For each problem, circle **all** the statements that are correct.

(a) Let $C(r)$ represent the total cost of paying off a car loan borrowed at an interest rate of $r\%$ per year. Then:

- The units of $C'(r)$ are \$/year.
- The expression $C'(5) = A$ (with units) represents the rate of change of the total cost of the car loan.
- The expression $C'(5) = A$ (with units) indicates that if the interest rate increases from 5% to 6%, the total cost of the loan would be approximately $C(5) + A$.
- The expression $C'(5)$ (with units) indicates that if the interest rate increases by 5%, then the total cost of the loan increases by about $C'(5)$.
- The expression $C'(5)$ (with units) indicates that if the interest rate increases from 5% to 6%, the total cost of the loan increases by about $C'(5)$.
- The sign of $C'(5)$ cannot be determined from the context of the information given.

(b) If the figure below shows position as a function of time for two sprinters running in parallel lanes, then:

- At time A , both sprinters have the same velocity.
- Both sprinters continually increase their velocity.
- Both sprinters run at the same velocity at some time before A .
- At some time before A , both sprinters have the same acceleration.

(c) Let f and g be differentiable functions. Assume f is an even function and g is an odd function. Then:

- g' is an even function.
- the composition, $f(g(x))$, is an odd function.
- $h(x) = f(x)g(x)$ is an odd function.

(d) Suppose that $f''(x) > 0$ everywhere. Then:

- $f'(x)$ is increasing.
- $f(b) > f(a)$ whenever $a < b$.
- $f'(x) < 0$.

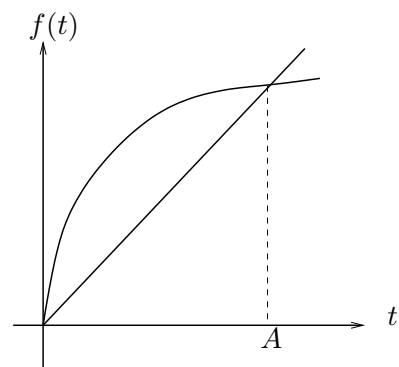


Figure for part (b)