Which of the following are true for this polynomial $s(t) = -t^3 + 6t^2 - 9t + 1$?

A. $s'(t) = -3t^3 + 12t^2 - 9t$ ◯ True   ◯ False

B. $s'(t) = (-3t + 3)(-3t + 9)$ ◯ True   ◯ False

C. $s'(t) = -3(t - 1)(t - 3)$ ◯ True   ◯ False

D. $s'(t) = -3t^2 + 12t - 9$ ◯ True   ◯ False

E. $s'(t) = -3t(t - 3)(t - 1)$ ◯ True   ◯ False

Scoring:
2 points: Selected C and D only.
1 point: Selected either C or D only.
                Selected C, D, and only one other incorrect response.
                Selected C or D and only one other incorrect response.
0 points: Any other combination.

Key and Distractor Analysis:
A. Student forgot to subtract the exponents by one.
B. Student incorrectly factored the quadratic.
C. Key. Student correctly took the first derivative and factored the quadratic completely.
D. Key. Student correctly took the first derivative of the polynomial.
E. Student incorrectly factored out a $-3t$ instead of just a -3.

Calculus   **4.4**

4.4 Students derive derivative formulas and use them to find the derivatives of algebraic, trigonometric, inverse trigonometric, exponential, and logarithmic functions.