

Algebra and Calculus: Quiz 5

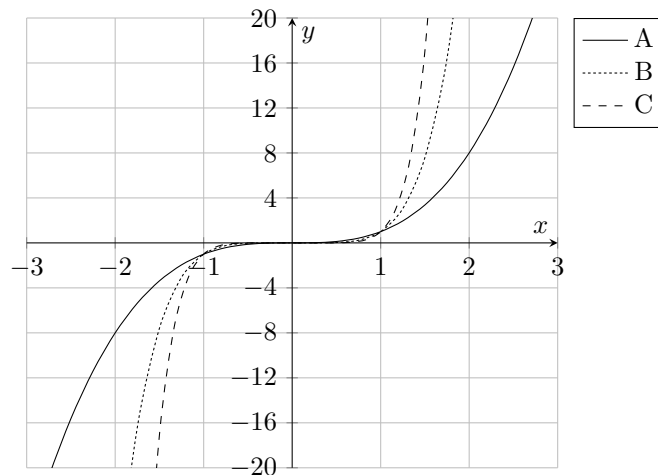
Name/NetID: _____

Complete all problems.

1. For **multiple choice** problems, circle the letter corresponding to the correct answer.
2. For **true or false** problems, indicate whether you believe the statement is true or false and put a box around your answer (as shown).
3. For **free response** problems, **show all work** and put a box around your final answer.

Good luck!

1. For the following three problems, answer **true or false**:
 - (a) The function $f(x) = (x - 1)^2(x + 3)(x - 4)^3$ changes sign three times.
 - (b) If a function has a corner, it must be discontinuous.
 - (c) The end behavior of a polynomial $a_nx^n + a_{n-1}x^{n-1} + \dots + a_1x + a_0$, $a_n \neq 0$, is determined by the term a_nx^n .
2. Consider the graph of three functions below. Each is given the labels A, B, and C:



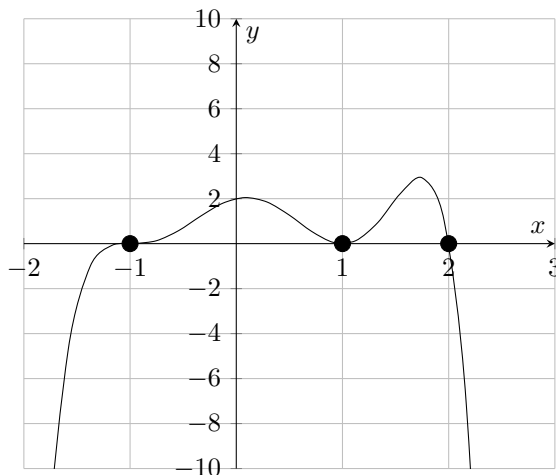
Which function corresponds to each graph?

- (a) A: $(x - 2)^3$, B: $(x - 2)^5$, C: $(x - 2)^7$
- (b) A: $(x - 2)^7$, B: $(x - 2)^5$, C: $(x - 2)^3$
- (c) A: x^3 , B: x^5 , C: x^7
- (d) A: x^7 , B: x^5 , C: x^3
- (e) A: x^5 , B: x^7 , C: x^3

3. You are told that $P(x) = Q(x)(x - 1) + R(x)$. Given $P(x) = x^2 + 3x - 1$, what are $Q(x)$ and $R(x)$?

- (a) $Q(x) = x + 4, R(x) = 3$
- (b) $Q(x) = x + 3, R(x) = 4$
- (c) $Q(x) = x + 2, R(x) = 0$
- (d) $Q(x) = 3, R(x) = x + 4$
- (e) $Q(x) = 4, R(x) = x + 3$

4. What function is this?



- (a) $f(x) = -(x + 1)^2(x - 1)^3(x - 2)$
- (b) $f(x) = -(x - 1)^2(x + 1)^3(x - 2)$
- (c) $f(x) = -(x - 1)^2(x + 1)^3(x - 2)^2$
- (d) $f(x) = -(x - 1)(x + 1)^3(x - 2)^2$
- (e) $f(x) = -(x - 1)^2(x + 1)^2(x - 2)$

5. You are told that two roots of the polynomial $P(x) = 2x^4 - 5x^3 - 5x^2 + 5x + 3$ are $x = -\frac{1}{2}$ and $x = 3$. Find the other roots.