

PRACTICE PROBLEMS FOR FINDING UNKNOWN COEFFICIENTS

1. Let $f(x) = ax^3 + bx^2 + cx + d$. Determine the values of a , b , c , and d so that $f(x)$ has critical points at $x = 2$ and $x = -1$, $f(0) = 1$, and $f'(0) = 6$.
2. The function $f(x) = \frac{1}{3}x^3 + bx^2 + c$ has a critical point at $(3, 2)$. Determine the constants b and c .
3. Let $f'(x) = ax^2 + bx + c$. Determine the values for a , b , and c so that $f(x)$ has a local maximum at $x = 3$, a local minimum at $x = -5$, and $f''(3) = -8$.
4. Let $f(x) = ax^3 + bx^2 + cx + 1$. Determine the values of a , b , and c so that $f(x)$ has a point of inflection at $x = 2$, a local minimum at $x = -2$, and $f(1) = 2$.

Answers

1. $a = -1, b = \frac{3}{2}, c = 6, d = 1$

2. $b = -\frac{3}{2}, c = 6.5$

3. $a = -1, b = -2, c = 15$

4. $a = -\frac{1}{41}, b = \frac{6}{41}, c = \frac{36}{41}$