

SECTION 5.2

- 5.2.1 Find the relative extrema for $f(x) = 3x^5 - 5x^4$.
- 5.2.2 Find the relative extrema for $f(x) = 12x^{2/3} - 16x$.
- 5.2.3 Find the relative extrema for $f(x) = x^{2/3}(5 - x)$.
- 5.2.4 Find the relative extrema for $f(x) = \frac{2}{5}x^{5/3} + 8x^{2/3}$.
- 5.2.5 Find the relative extrema for $f(x) = \frac{1}{3}x^{4/3} - \frac{4}{3}x^{1/3}$.
- 5.2.6 Find the relative extrema for $f(x) = \frac{x^4}{4} - 2x^2 + 1$.
- 5.2.7 The derivative of a continuous function is $f'(x) = 2(x - 1)^2(2x + 1)$. Find all critical points and determine whether a relative maximum, relative minimum or neither occurs there.
- 5.2.8 The derivative of a continuous function is $f'(x) = \frac{2}{3}x^{\frac{1}{3}} - \frac{2}{3}x^{-\frac{2}{3}}$. Find all critical points and determine whether a relative maximum, relative minimum or neither occurs there.
- 5.2.9 Find the relative extrema for $f(x) = 2x + 2x^{2/3}$.
- 5.2.10 Find the relative extrema for $f(x) = \frac{1}{x} - \frac{1}{3x^3}$.
- 5.2.11 Find the relative extrema for $f(x) = x^{4/3} - 4x^{-1/3}$.
- 5.2.12 Find the relative extrema for $f(x) = 6x^2 - 9x + 5$.
- 5.2.13 Find the relative extrema for $f(x) = x^4 - 6x^2 + 17$.
- 5.2.14 Find the relative extrema for $f(x) = (x + 1)^{-\frac{1}{3}}$.
- 5.2.15 Find the relative extrema for $f(x) = x + \cos 2x$, $0 < x < \pi$.
- 5.2.16 Find the relative extrema for $f(x) = x - \sin 2x$, $0 < x < \pi$.
- 5.2.17 Which of the following statements is correct if $f'(x_0) = 0$ and $f''(x_0) = 0$:
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| (a) x_0 is a local minimum | (b) x_0 is a local maximum |
| (c) x_0 is a point of inflection | (d) Any one of (a), (b), (c) may happen. |
- 5.2.18 Which of the following statements about the graph of $f(x) = 2x^4 + x + 1$ is correct:
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| (a) There is a relative minimum at $x = -\frac{1}{2}$ and a point of inflection at $x = 0$. |
| (b) There is a relative maximum at $x = -\frac{1}{2}$ and a point of inflection at $x = 0$. |
| (c) There are no relative extrema, but there is a point of inflection at $x = 0$. |
| (d) There is a relative minimum at $x = -\frac{1}{2}$, but there is no point of inflection. |
| (e) There are no local extrema and no points of inflection. |

5.2.19 Which of the following statements about the graph of $g(x) = (x^2 - 1)^3$ is correct:

- (a) There are three relative minima and two points of inflection.
- (b) There are two relative minima and three points of inflection.
- (c) There is one local minimum and four points of inflection.
- (d) There are no local minima and five points of inflection.
- (e) There are two relative minima and two points of inflection.