

# SAT PREP

## Finding Inflection Points

For each problem, find the x-coordinates of all points of inflection.

1)  $y = x^3 - 2x^2 + 1$

2)  $y = \frac{x^2}{2x + 2}$

3)  $y = x^4 - 3x^2$

4)  $y = -x^5 + 2x^3 + 4$

5)  $y = x^5 - 2x^3$

6)  $y = -\frac{2x}{x + 3}$

7)  $y = -x^4 + 3x^2 - 4$

8)  $y = -\frac{9x^2 - 9}{x^3}$

9)  $y = -\frac{x^3}{x^2 - 1}$

10)  $y = -2\sin(x); [-\pi, \pi]$

11)  $y = -(-3x + 3)^{\frac{1}{2}}$

12)  $y = -(x + 2)^{\frac{2}{3}}$

13)  $y = -(4x + 20)^{\frac{1}{3}}$

14)  $y = x^3 + 9x^2 + 24x + 22$

15)  $y = -\frac{1}{4}(x + 2)^{\frac{8}{3}} + 4(x + 2)^{\frac{2}{3}} - 2$

16)  $y = \left(\frac{x - 3}{x + 1}\right)^2$

17)  $y = 2x^2 + 4x + 4$

18)  $y = -2\sec(2x); [-\pi, \pi]$

19)  $y = \frac{1}{6}(x - 2)^{\frac{7}{3}} - \frac{14}{3}(x - 2)^{\frac{1}{3}} - 1$

20)  $y = -\sin(2x); [-\pi, \pi]$



## Answers to Finding Inflection Points

- 1) Inflection point at:  $x = \frac{2}{3}$
- 2) No inflection points exist.
- 3) Inflection points at:  $x = -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$
- 4) Inflection points at:  $x = -\frac{\sqrt{15}}{5}, 0, \frac{\sqrt{15}}{5}$
- 5) Inflection points at:  $x = -\frac{\sqrt{15}}{5}, 0, \frac{\sqrt{15}}{5}$
- 6) No inflection points exist.
- 7) Inflection points at:  $x = -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$
- 8) Inflection points at:  $x = -\sqrt{6}, \sqrt{6}$
- 9) Inflection point at:  $x = 0$
- 10) Inflection points at:  $x = -\pi, 0, \pi$
- 11) No inflection points exist.
- 12) No inflection points exist.
- 13) Inflection point at:  $x = -5$
- 14) Inflection point at:  $x = -3$
- 15) No inflection points exist.
- 16) Inflection point at:  $x = 5$
- 17) No inflection points exist.
- 18) No inflection points exist.
- 19) Inflection point at:  $x = 2$
- 20) Inflection points at:  $x = -\pi, -\frac{\pi}{2}, 0, \frac{\pi}{2}, \pi$

