Name_____

Calculus Practice: Use Derivatives to Analyze Functions 6a

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

1) $f(x) = x^5 - 3x^3 + 3$

   A) Inflection points at: $x = -\dfrac{6\sqrt{10}}{5}, 4, \dfrac{6\sqrt{10}}{5}$

   B) Inflection points at: $x = -\dfrac{\sqrt{10}}{10}, \dfrac{1}{3}, \dfrac{\sqrt{10}}{10}$

   C) No inflection points exist.

   D) Inflection points at: $x = -\dfrac{3\sqrt{10}}{10}, 0, \dfrac{3\sqrt{10}}{10}$

2) $f(x) = x^3 + 14x^2 + 60x + 77$

   A) No inflection points exist.   B) Inflection point at: $x = -\dfrac{56}{3}$

   C) Inflection point at: $x = -\dfrac{14}{3}$ D) Inflection point at: $x = -\dfrac{14}{9}$

3) $f(x) = x^3 - 3x^2 + 6$

   A) Inflection point at: $x = 1$ B) Inflection point at: $x = 4$

   C) Inflection point at: $x = \dfrac{1}{3}$ D) No inflection points exist.

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

   A) Inflection points at: $x = -\dfrac{\sqrt{15}}{5}, 0, \dfrac{\sqrt{15}}{5}$

   B) Inflection points at: $x = -\dfrac{4\sqrt{15}}{5}, 4, \dfrac{4\sqrt{15}}{5}$

   C) No inflection points exist.

   D) Inflection points at: $x = -\dfrac{\sqrt{15}}{15}, \dfrac{1}{3}, \dfrac{\sqrt{15}}{15}$

5) $f(x) = -x^4 + x^2 - 2$

   A) Inflection points at: $x = -\dfrac{\sqrt{6}}{18}, \dfrac{\sqrt{6}}{18}$ B) No inflection points exist.

   C) Inflection points at: $x = -\dfrac{\sqrt{6}}{6}, \dfrac{\sqrt{6}}{6}$ D) Inflection points at: $x = -\dfrac{2\sqrt{6}}{3}, \dfrac{2\sqrt{6}}{3}$

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

   A) Inflection point at: $x = 1$ B) Inflection point at: $x = \dfrac{1}{3}$

   C) No inflection points exist.   D) Inflection point at: $x = 4$

7) $y = -x^5 + 2x^3 + 1$

   A) Inflection points at: $x = -\dfrac{\sqrt{15}}{15}, \dfrac{1}{3}, \dfrac{\sqrt{15}}{15}$

   B) Inflection points at: $x = -\dfrac{\sqrt{15}}{5}, 0, \dfrac{\sqrt{15}}{5}$

   C) Inflection points at: $x = -\dfrac{4\sqrt{15}}{5}, 4, \dfrac{4\sqrt{15}}{5}$

   D) No inflection points exist.

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

   A) Inflection points at: $x = \dfrac{12 - 2\sqrt{6}}{3}, \dfrac{12 + 2\sqrt{6}}{3}$

   B) Inflection points at: $x = \dfrac{6 - \sqrt{6}}{6}, \dfrac{6 + \sqrt{6}}{6}$

   C) No inflection points exist.

   D) Inflection points at: $x = \dfrac{6 - \sqrt{6}}{18}, \dfrac{6 + \sqrt{6}}{18}$

9) $y = -x^4 - x^3 + 3x^2 + 1$

   A) Inflection points at: $x = -4, 2$ B) No inflection points exist.

   C) Inflection points at: $x = -1, \dfrac{1}{2}$ D) Inflection points at: $x = -\dfrac{1}{3}, \dfrac{1}{6}$

10) $f(x) = x^5 - 2x^3 + 1$

   A) Inflection points at: $x = -\dfrac{4\sqrt{15}}{5}, 4, \dfrac{4\sqrt{15}}{5}$

   B) No inflection points exist.

   C) Inflection points at: $x = -\dfrac{\sqrt{15}}{5}, 0, \dfrac{\sqrt{15}}{5}$

   D) Inflection points at: $x = -\dfrac{\sqrt{15}}{15}, \dfrac{1}{3}, \dfrac{\sqrt{15}}{15}$

11) $y = \dfrac{x^2}{2} + 2x + 2$

   A) Inflection point at: $x = 3$ B) Inflection point at: $x = 4$
   C) No inflection points exist.   D) Inflection point at: $x = 2$

12) $y = -\dfrac{x^2}{2} - 2x + 2$

   A) No inflection points exist.   B) Inflection point at: $x = 2$
   C) Inflection point at: $x = 3$ D) Inflection point at: $x = 4$

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