Name : _____ Score : _____

Teacher : _____ Date : _____

Understanding of Critical Points

Find the critical points, discontinuities and the intervals where the function is increasing and decreasing.

1) $y = x^4 - 12x^3 + 48x^2 - 64x + 20$

2) $y = x^2 - 4x + 22$

3) $y = -x^3 + 3x^2 + 45x + 5$

4) $y = x^3 - 9x^2 + 15x - 21$

5) $y = x^4 - 8x^2 - 23$

6) $y = 2x^3 - 9x^2 - 23$

7) $y = -x^2 + 6x + 20$

8) $y = -x^2 - 10x - 14$

9) $y = x^3 - 12x + 24$

10) $y = -x^2 - 8x - 21$

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Understanding of Critical Points

Find the critical points, discontinuities and the intervals where the function is increasing and decreasing.

1) $y = x^4 - 12x^3 + 48x^2 - 64x + 20$

Critical Point at x = 1, 4
No discontinuities.
Decreasing: (-∞, 1)
Increasing: (1, ∞)

2) $y = x^2 - 4x + 22$

Critical Point at x = 2
No discontinuities.
Decreasing: (-∞, 2)
Increasing: (2, ∞)

3) $y = -x^3 + 3x^2 + 45x + 5$

Critical Point at x = -3, 5
No discontinuities.
Decreasing: (-∞, -3), (5, ∞)
Increasing: (-3, 5)

4) $y = x^3 - 9x^2 + 15x - 21$

Critical Point at x = 1, 5
No discontinuities.
Increasing: (-∞, 1), (5, ∞)
Decreasing: (1, 5)

5) $y = x^4 - 8x^2 - 23$

Critical Point at x = -2, 0, 2
No discontinuities.
Decreasing: (-∞, -2), (0, 2)
Increasing: (-2, 0), (2, ∞)

6) $y = 2x^3 - 9x^2 - 23$

Critical Point at x = 0, 3
No discontinuities.
Increasing: (-∞, 0), (3, ∞)
Decreasing: (0, 3)

7) $y = -x^2 + 6x + 20$

Critical Point at x = 3
No discontinuities.
Increasing: (-∞, 3)
Decreasing: (3, ∞)

8) $y = -x^2 - 10x - 14$

Critical Point at x = -5
No discontinuities.
Increasing: (-∞, -5)
Decreasing: (-5, ∞)

9) $y = x^3 - 12x + 24$

Critical Point at x = -2, 2
No discontinuities.
Increasing: (-∞, -2), (2, ∞)
Decreasing: (-2, 2)

10) $y = -x^2 - 8x - 21$

Critical Point at x = -4
No discontinuities.
Increasing: (-∞, -4)
Decreasing: (-4, ∞)