

Name _____

Graphing Polynomials Ex

Date _____

Accelerated Geometry

GRAPH EACH POLYNOMIAL FUNCTION. Determine the Local Minimum, Local Maximum, Y-Intercept, End Behavior, Domain/Range, and Intervals of Increase/Decrease of each graph.

1) $f(x) = x^3 + 2x^2 - 33x - 90$; $-3, 6, & -5$ are the roots

Local Minimum: $(1.5, -131.625)$

Local Maximum: $(-4, 10)$

Y-Intercept: $(0, -90)$

End Behavior: $\text{As } x \rightarrow -\infty, f(x) \rightarrow -\infty$. $\text{As } x \rightarrow \infty, f(x) \rightarrow \infty$

Domain: \mathbb{R}

Range: \mathbb{R}

Increase: $(-\infty, -4)$ $(1.5, \infty)$

Decrease: $(-4, 1.5)$

2) $f(x) = x^4 + 8x^3 + 16x^2$; 0 mult of 2 & -4 mult of 2 are the roots

Local Minimum: $(-4, 0)$ $(0, 0)$

Local Maximum: $(-2, 16)$

Y-Intercept: $(0, 0)$

End Behavior: $\text{As } x \rightarrow -\infty, f(x) \rightarrow \infty$. $\text{As } x \rightarrow \infty, f(x) \rightarrow \infty$

Domain: \mathbb{R}

Range: $y \geq 0$

Increase: $(-4, -2)$ $(0, \infty)$

Decrease: $(-\infty, -4)$ $(-2, 0)$

3) $f(x) = x^5 - 34x^3 + 225x$; $0, \pm 3, & \pm 5$ are the roots

Local Minimum: $(-1.5, -230.3)$ $(4, -252)$ Local Maximum: $(-4, 252)$ $(1.5, 230.3)$

Y-Intercept: $(0, 0)$

End Behavior: $\text{As } x \rightarrow -\infty, f(x) \rightarrow -\infty$. $\text{As } x \rightarrow \infty, f(x) \rightarrow \infty$

Domain: \mathbb{R}

Range: \mathbb{R}

Increase: $(-\infty, -4)$ $(-1.5, 1.5)$ $(4, \infty)$

Decrease: $(-4, -1.5)$ $(1.5, 4)$

4) $f(x) = -4x^2 - 8x + 60$; -5 & 3 are the roots

Local Minimum: None

Local Maximum: $(-1, 64)$

Y-Intercept: $(0, 60)$

End Behavior: $\text{As } x \rightarrow -\infty, f(x) \rightarrow -\infty$. $\text{As } x \rightarrow \infty, f(x) \rightarrow -\infty$

Domain: \mathbb{R}

Range: $y \leq 64$

Increase: $(-\infty, -1)$

Decrease: $(-1, \infty)$

5) $f(x) = -x^3 + 4x^2 + 7x - 10$; $-2, 5, & 1$ are the roots

Local Minimum: $(-1, -12.375)$

Local Maximum: $(3, 20)$

Y-Intercept: $(0, -10)$

End Behavior: AS $x \rightarrow -\infty, f(x) \rightarrow \infty$. AS $x \rightarrow \infty, f(x) \rightarrow -\infty$

Domain: \mathbb{R}

Range: \mathbb{R}

Increase: $(-1, 3)$

Decrease: $(-\infty, -1) (3, \infty)$

6) $f(x) = x^3 - 4x$; $0 & \pm 2$ are the roots

Local Minimum: $(1, -3)$

Local Maximum: $(-1, 3)$

Y-Intercept: $(0, 0)$

End Behavior: AS $x \rightarrow -\infty, f(x) \rightarrow -\infty$ AS $x \rightarrow \infty, f(x) \rightarrow \infty$

Domain: \mathbb{R}

Range: \mathbb{R}

Increase: $(-\infty, -1) (1, \infty)$

Decrease: $(-1, 1)$

7) $f(x) = x^5 - x^4 - \frac{3}{2}x^3 + 5x^2 - 2x$; $0, 1$ mult of 3, & -2 are the roots

Local Minimum: $(1.5, -1.16)$

Local Maximum: $(-1, 8)$

Y-Intercept: $(0, 0)$

End Behavior: AS $x \rightarrow -\infty, f(x) \rightarrow -\infty$. AS $x \rightarrow \infty, f(x) \rightarrow \infty$

Domain: \mathbb{R}

Range: \mathbb{R}

Increase: $(-\infty, -1) (1.5, \infty)$

Decrease: $(-1, 1.5)$

8) $f(x) = -x^6 + 6x^5 - 32x^3$; 0 mult of 3, -2 , & 4 mult of 2 are the roots

Local Minimum: $(2, -128)$

Local Maximum: $(-1, 25) (4, 0)$

Y-Intercept: $(0, 0)$

End Behavior: AS $x \rightarrow -\infty, f(x) \rightarrow -\infty$ AS $x \rightarrow \infty, f(x) \rightarrow -\infty$

Domain: \mathbb{R}

Range: $y \leq 25$

Increase: $(-\infty, -1) (2, 4)$

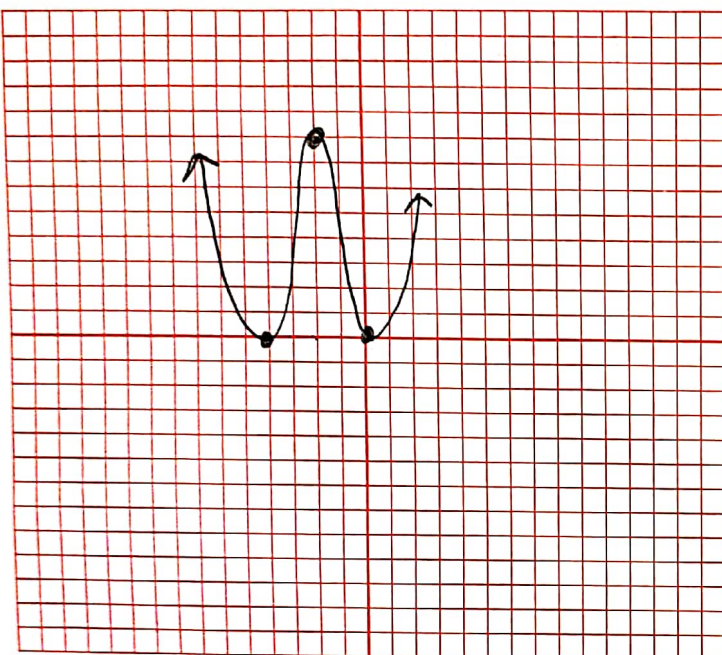
Decrease: $(-1, 2) (4, \infty)$

(1.5, -131.625)

(-4, 10)



(-2, 16)

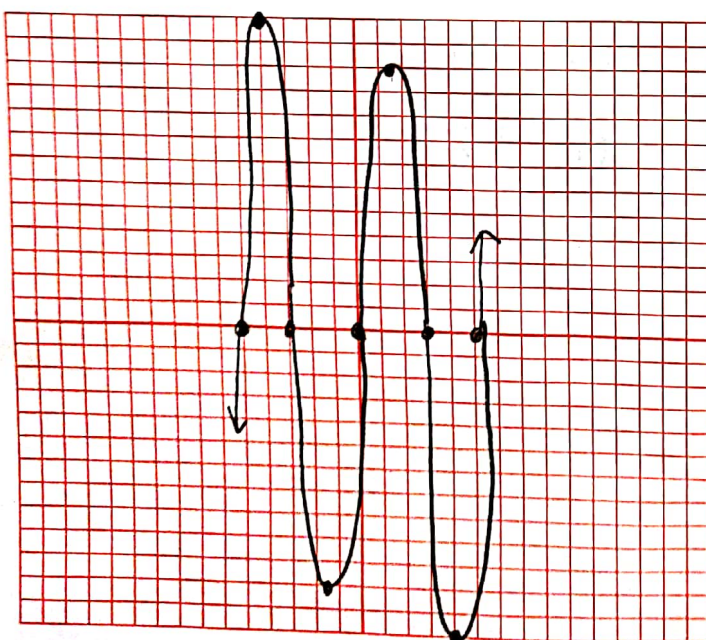


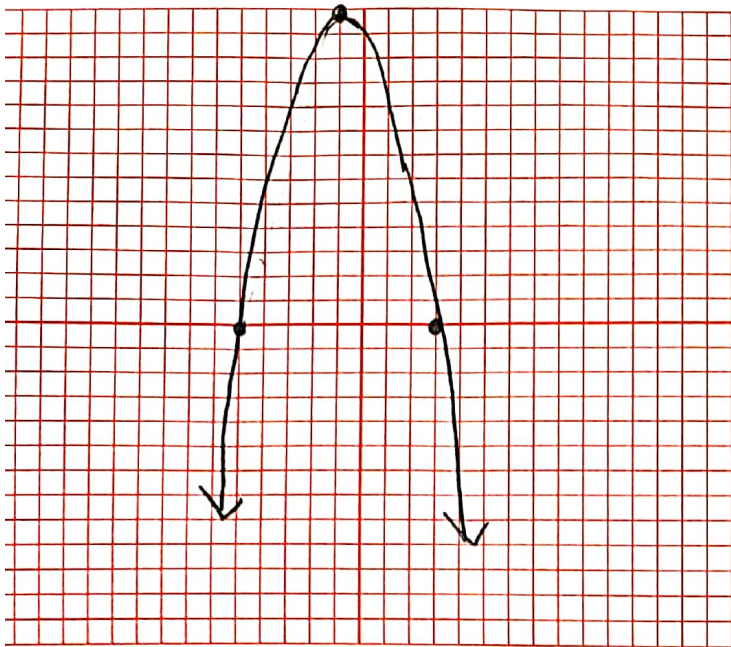
(-4, 252)

(-1.5, -230.3)

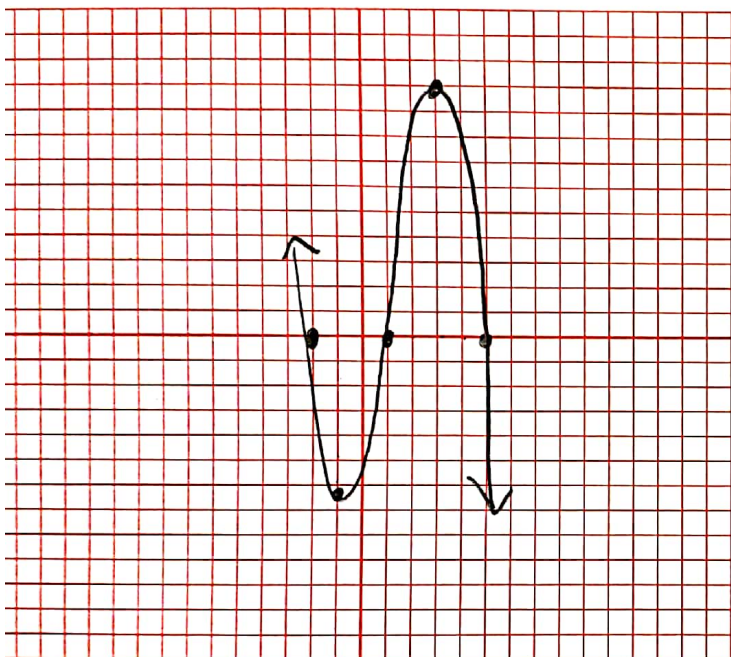
(1.5, 230.3)

(4, -252)



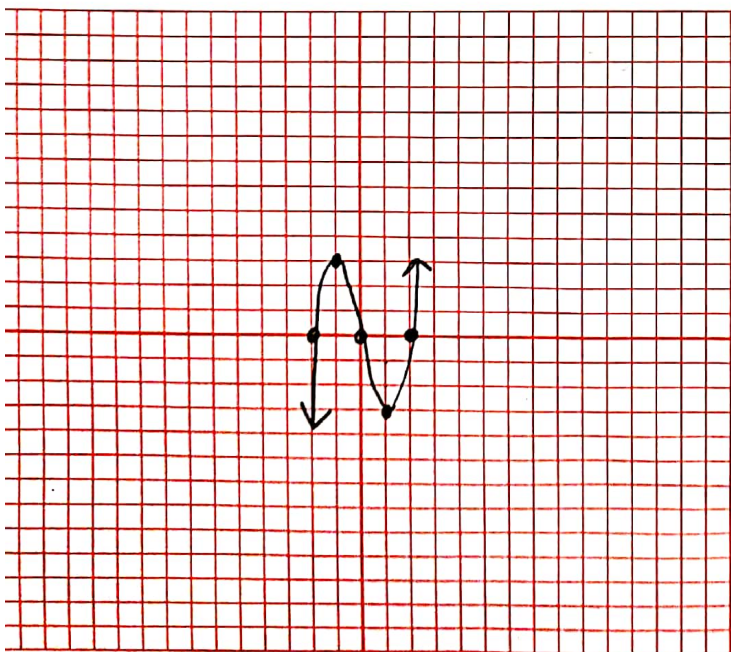


$(-1, 64)$



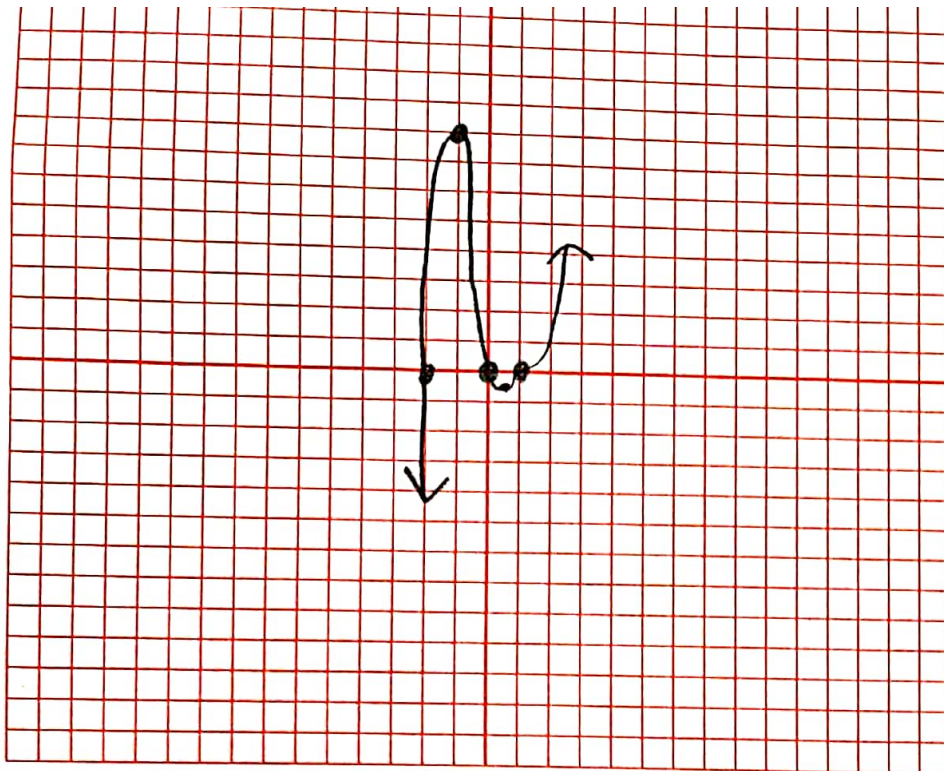
$(-0.5, -12.375)$

$(3, 20)$



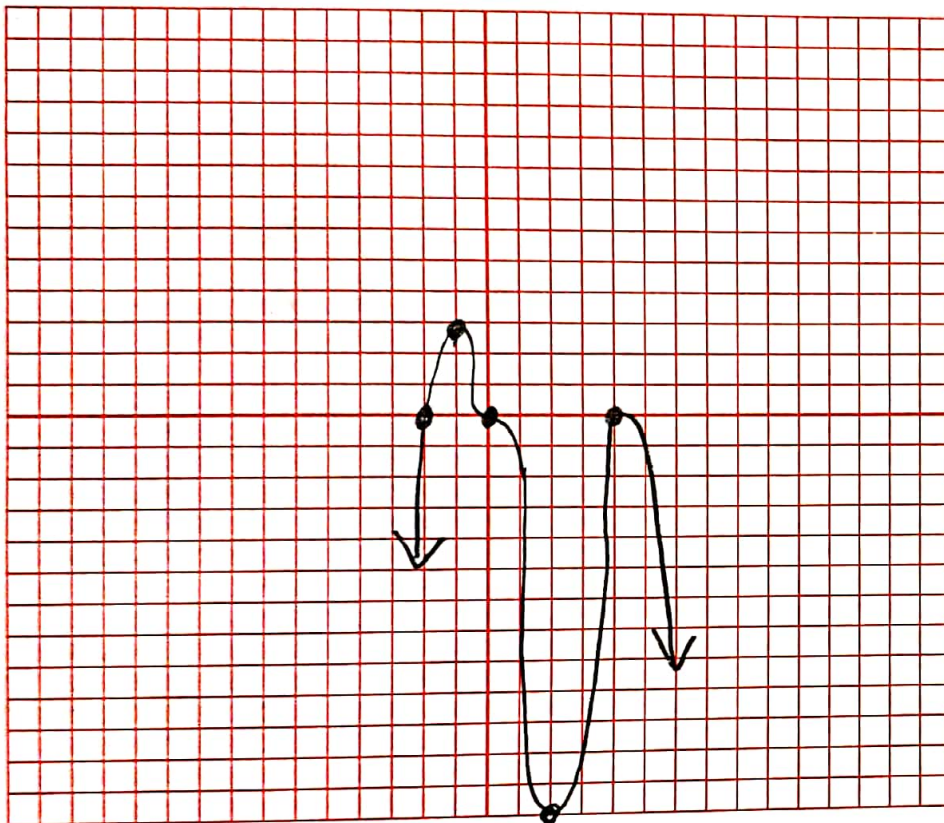
$(-1, 3)$

$(1, -3)$



$(-1, 8)$

$(-5, -16)$



$(2, -128)$

$(-1, 25)$

