p177 50,53,56,57 p202 1-24, not 4's

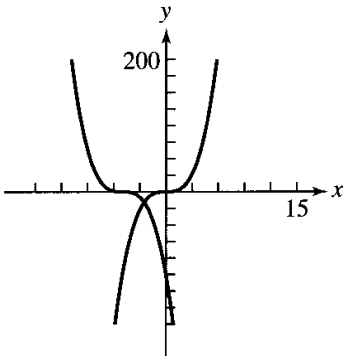
50. (a)

[0, 90] by [0, 70]

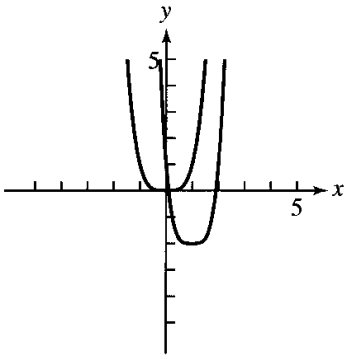
(b) Strong negative

56. 11 ft by 14 ft

2. Shift $y = x^3$ to the left by 5 units and then reflect over the x-axis. y-intercept: $(0, -125)$

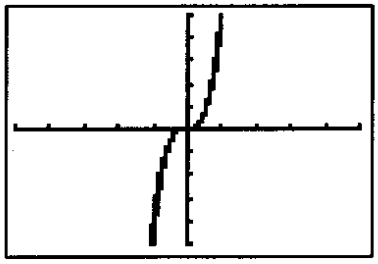


6. Shift $y = x^4$ to the right 1 unit, vertically stretch by 3, and vertically shift down 2 units. y-intercept: $(0, 1)$



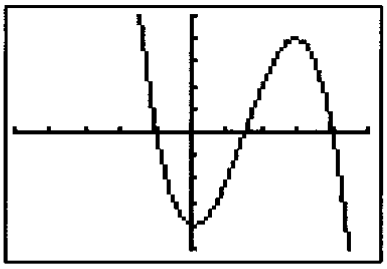
10. b

14. One possibility:



[−50, 50] by [−1000, 1000]

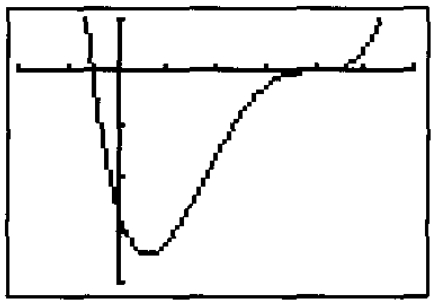
18.



[−5, 5] by [−15, 15]

$\lim_{x \to \infty} f(x) = -\infty$; $\lim_{x \to -\infty} f(x) = \infty$

22.



$[-2, 6]$ by $[-100, 25]$

$\lim_{x \to \infty} f(x) = \infty$; $\lim_{x \to -\infty} f(x) = \infty$

A polynomial of degree *n* has at most **local extrema and at most zeros.**

1. Graph the function $f(x) = x^3 - 2x^2 - 41x + 42$ in a viewing window that shows extrema and x-intercepts. Describe end behavior using limits.

2. Describe the end behavior of the function $f(x) = x^3 - x^4 + 3x^2 - 2x + 7$ using limit notation.

3. Find the zeros of the function $f(x) = x^3 - 25x$ algebraically.

4. State the degree and list the zeros of the function $f(x) = x^4 - x^3 - 12x^2$. State the multiplicity of each zero and whether the graph crosses the x-axis at x-intercept. Then sketch the graph.