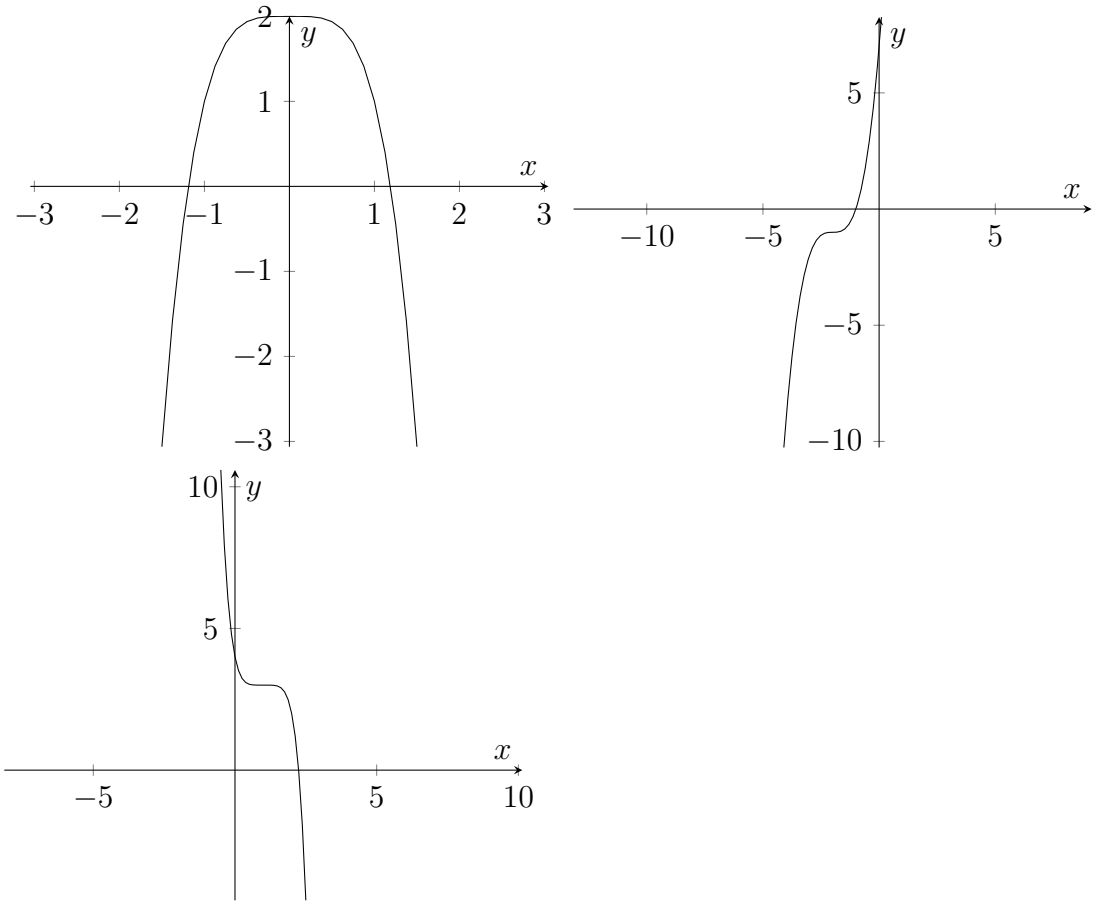
Practice Problems - Lecture 16

Problem 1. Sketch the graph of the polynomial function, and state the intervals on which the function is increasing or decreasing:
(a) $f(x) = -x^4 + 2$;
(b) $f(x) = (x+2)^3 - 1$;
(c) $f(x) = -(x-1)^5 + 3$.

Problem 2. Describe the end behavior of the graph of each polynomial function:
(a) $f(x) = -x^3 - 4x^2 + 2x - 1$;
(b) $f(x) = 10x^6 - x^5 + 2x - 2$;
(c) $f(x) = 4x^7 - x^5 + x^3 - 1$;
(d) $f(x) = 7 + 2x - 5x^2 - 10x^4$.

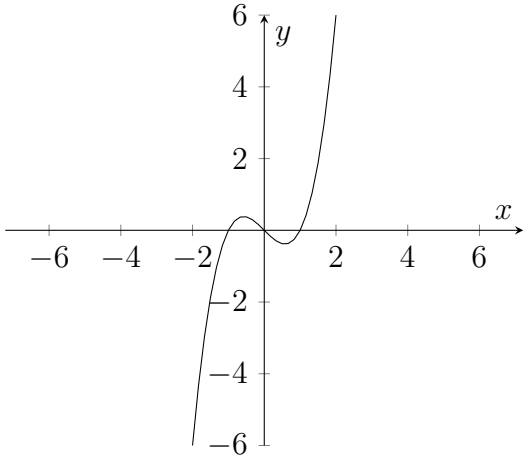
Problem 3. Graph each polynomial function:
(a) $f(x) = x(x+1)(x-1)$;
(b) $f(x) = x^2(x-5)(x+3)(x-1)$;
(c) $f(x) = (4x+3)(x+2)^2$;
(d) $f(x) = x^2(x-3)^3(x+1)$.

Answers:



1. (a) Increasing: $(-\infty, 0)$, Decreasing: $(0, \infty)$;
(b) Increasing: $(-\infty, \infty)$, Decreasing: $\emptyset$;
(c) Increasing: $\emptyset$, Decreasing: $(-\infty, \infty)$.

2. (a) $\uparrow\downarrow$; (b) $\uparrow\uparrow$; (c) $\downarrow\uparrow$; (d) $\downarrow\downarrow$.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x
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−4
−2
2
4
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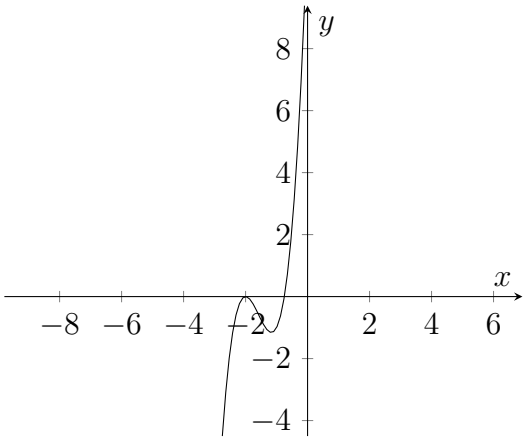
−2
−4
−6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x
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2
4
6
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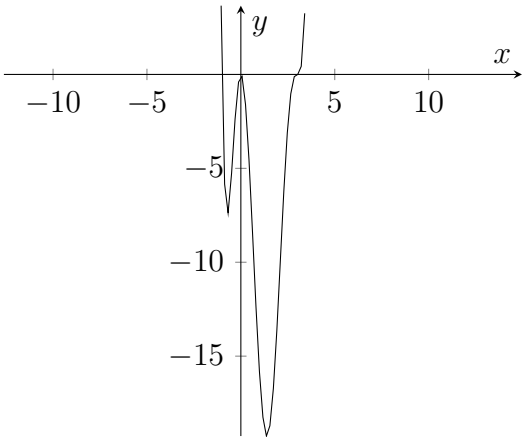
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