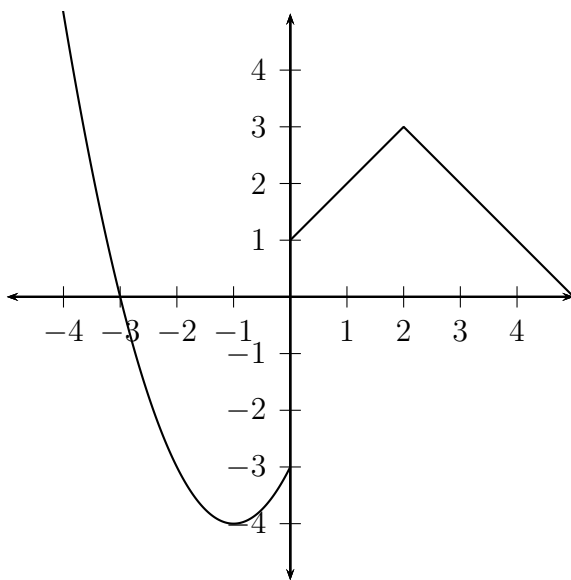# Review for Exam 3
## MA 105
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### 11 Mar 2014

1) Use standard graph transformations to graph the function $f(x) = (x-3)^6$.

2) Graph the function $f(x) = 2 - \frac{3}{(x+1)^2}$ using transformations.

3) Determine if the graph below could be the graph of a polynomial function. If it could, give its real zeros.



4) Write the equation for a polynomial with degree 3 which has a zero at 5 of multiplicty 1 and a zero at -1 of multiplicity 2.

5) Find the complex zeros of $f(x) = x^3 + 1331$. Use the complex zeros to write the polynomial in factored form.

6) Find the domain of $f(x) = \sqrt{\frac{1-x}{x-2}}$.

7) Use the Intermediate Value Theorem to determine if $f(x) = 2x^3 - 3x^2 + x + 1$ has a zero in the interval $[-1, 0]$.

8) Graph the function $f(x) = \frac{1}{x} - 2$ using transformations.

9) Use the Rational Zero Test to find all the real zeros of $f(x) = 2x^3 + 17x^2 + 22x + 7$ and use the zeros to factor $f(x)$.

10) The polynomial $f(x)$ has degree 4 and zeros $-i$ and $2 + 2i$. Give its other zeros.

11) Is $f(x) = 3x^2 + 2(-x)^3 + 3(x^5) + 3(-x)^5$ a polynomial? If so, what it its degree?

12) Find the horizontal, vertical, and oblique asymptotes (if any) of $f(x) = \frac{-x^2+x}{2x^2-8}$.

13) Use the remainder theorem to find the remainder of $f(x) = 5x^3 + 3x^2 - x + 12$ when it is divided by $x + 1$. Is $x + 1$ a factor of $f(x)$? (Reason using the factor theorem.)

14) Construct a polynomial function which might have the given graph.
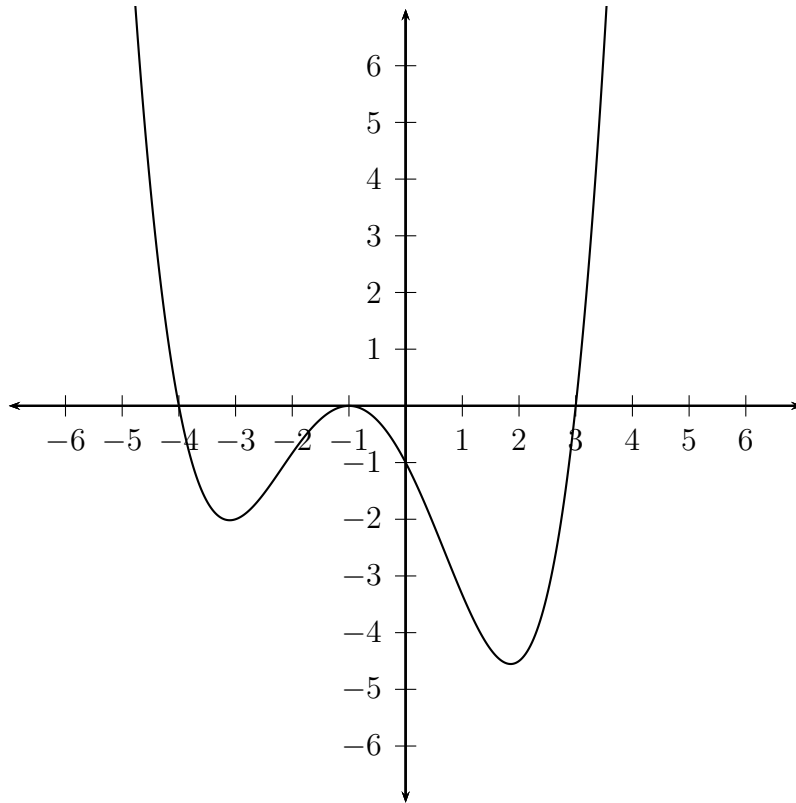


15) List all possible rational zeros of the polynomial $f(x) = x^5 - 3x^3 + x^2 + 7$. Do not attempt to find the zeros.

16) Solve the inequality $\frac{(x-1)^2(x+2)}{x^2} \leq 0$.

17) Use transformations to graph $f(x) = -x^7 + 1$.

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18) Use transformations to graph $f(x) = (x-2)^5 - 2$.

19) Find the domain of $f(x) = \frac{x^2-1}{(x+5)(x-7)}$.

20) Solve the inequality $(x-1)(x+5)(x+1) \geq 0$.