

**PROF. ALFRED DOLICH MATH 14 TEST #3
REVIEW**

Do the following ten question, each worth 10 points. You may use a scientific calculator, although it is not necessary. Please make sure you show your work and clearly write your final answer.

(1) Sketch the graph of $f(x) = -(x - 2)^3 + 2$

(2) Let $f(x) = x + 1$ and $g(x) = |3x - 1|$. Compute:
 $f \circ g(x)$, $f + g(x)$, and $g - f(x)$.

(3) Find the inverse function of $f(x) = 6x - 2$.

(4) Suppose that $f(x)$ is a quadratic function with vertex $(-1, 1)$ and so that the point $(2, 5)$ lies on its graph. Find an equation for $f(x)$.

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(5) Let $f(x) = x^5 - 7x^3 + 1$. At most how many zeros can $f(x)$ have? At most how many turning points?

(6) Find the quotient and remainder when $x^4 - 7x + 2$ is divided by $x^3 - x^2 + x - 1$.

(7) Find the zeros of $f(x) = x^3 - x$.

(8) Let $f(x) = \frac{x^2 - 5x + 2}{x^2 + 5x + 4}$. Find the vertical and horizontal asymptotes of $f(x)$.

(9) Sketch the graph of $f(x) = -(x + 1)^2(x - 3)(x - 1)^2$.

(10) Solve

$$\frac{x + 6}{x + 1} > 2$$