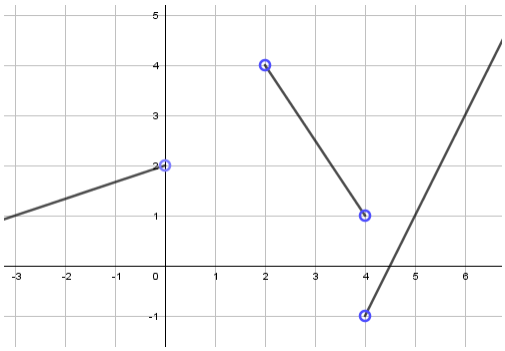
Quiz 3 Class Sequence ID:

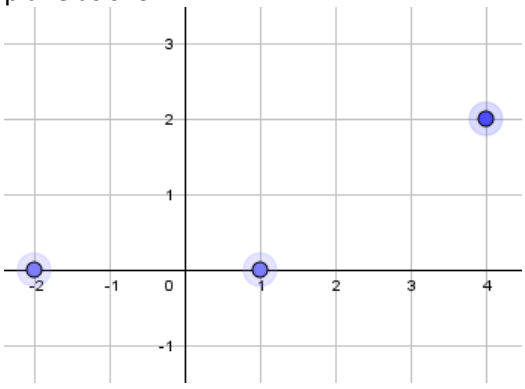
1. Given three complex numbers $z_1 = ci$, $z_2 = (a-b)+(a-c)i$, and $z_3 = a+(c-a+b)i$ where a, b, c are real numbers. If $2z_1 + z_2 = 1+8i$ and $z_2 + z_3 = 4+2i$

Calculate $\left|\frac{z_3}{z_1} + \frac{z_1}{z_2}\right|$

2. Given a graph below, write a piecewise defined function (assumed each segment can be represented by a linear function), the entire real number line is the domain.



3. Assume $f(x)$ is a 4th degree polynomial and all coefficients of $f(x)$ are real numbers. If some of the zeros of $f(x)$ are located in the complex plane as shown.



and $f(0) = -8$.

Find $f(x)$ (in general form)

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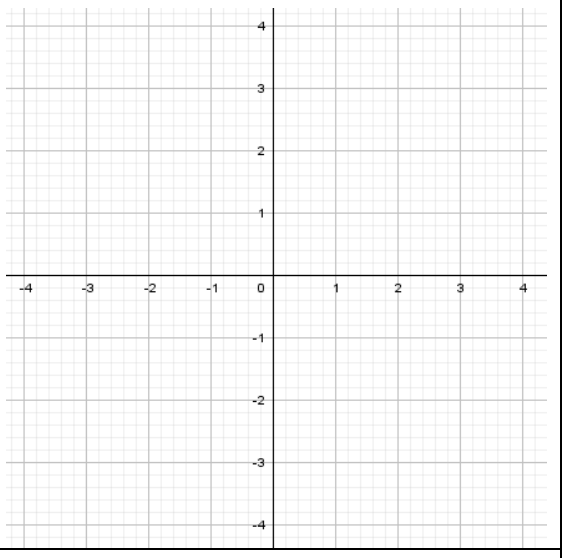
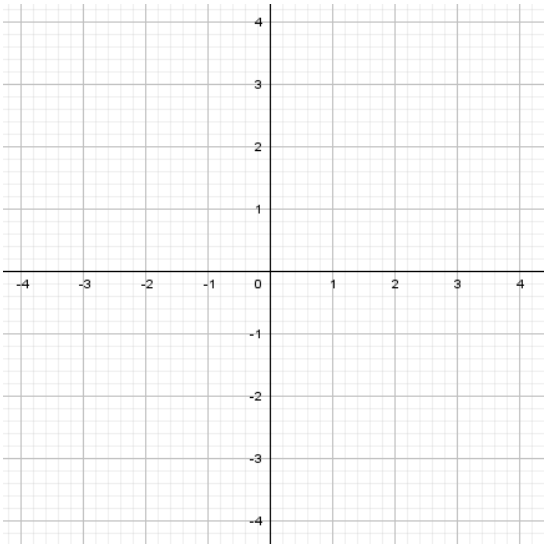
4. (a) Find and graph $(f \circ g)(x)$, also
(b) identify the implied domain, range, (use interval notation),
(c) identify x and y intercepts of the composite function if $f(x) = \sqrt{x}$, $g(x) = 4 - x^2$



5. (a)Find and graph $(g \circ f)(x)$, also
(b)identify the implied domain, range (use interval notation),
(c) identify x and y intercepts of the composite function if $f(x) = \sqrt{x}$, $g(x) = 4 - x^2$ (hint: the implied domain is not $x \in \mathbb{R}$)



6. Find all zeros of $f(x)$, if
$f(x) = 3x^4 + 11x^2 - 20$. Graph the zeros of $f(x)$ on the complex plane.