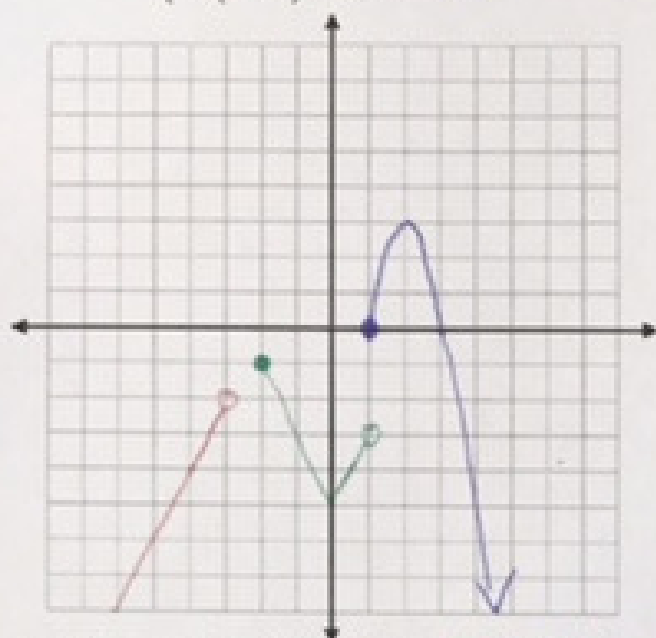


# End of 1<sup>st</sup> Semester Graphing Calculator Quiz Review

Graph:  $f(x) = \begin{cases} 2x+4, & x < -3 \\ 2|x|-5, & -2 \leq x < 1 \\ -3(x-2)^2+3, & x \geq 1 \end{cases}$



On what interval(s) is  $f(x)$  decreasing?  $[-2, 0) \cup (2, \infty)$

On what interval(s) is  $f(x)$  positive?  $(1, 3)$

What is the domain of  $f(x)$ ?  $(-\infty, -3) \cup [-2, \infty)$

What are the zeros of  $f(x)$ ?  $x = 1$  and  $3$

What is the average rate of change of  $f(x)$  on  $[1, 2]$ ?

$$m = \frac{3}{1} = \boxed{3}$$

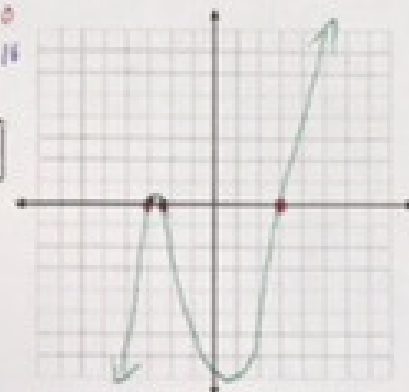
List all of the complex roots of  $g(x)$  and sketch it.

$$g(x) = \frac{1}{i\pi} (3x+7)(x^2+16)(x^2-9)$$

$$\begin{aligned} 3x+7 &= 0 & x^2+16 &= 0 \\ \rightarrow & \rightarrow & -16 & -16 \\ \frac{x}{3} &= \frac{-7}{3} & \sqrt{x^2} &= \sqrt{-16} \\ & & x &= \pm 4i \end{aligned}$$

$$x = -\frac{7}{3} \text{ or } -2\frac{1}{3}$$

$$\begin{aligned} x^2-9 &= 0 & \sqrt{x^2} &= \sqrt{9} \\ +1 & +1 & x &= \pm 3 \end{aligned}$$



$320, 80, 20, 5, \dots$

Write the rule for the sequence.

$$320\left(\frac{1}{4}\right)^n$$

What is the 7<sup>th</sup> term of the sequence?

$$320\left(\frac{1}{4}\right)^7 = \frac{5}{256} \approx .019$$

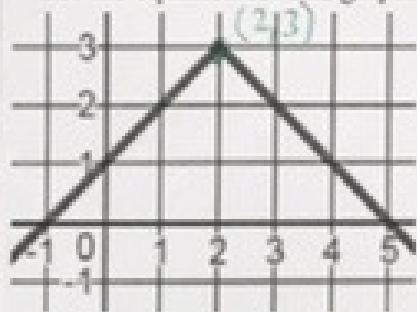
What is the sum of the first 7 terms in the series? (Round your answer to the hundredths place)

$$80\left(\frac{1-\frac{1}{4}^7}{1-\frac{1}{4}}\right) \approx 106.6601$$

What is the sum of the infinite series?

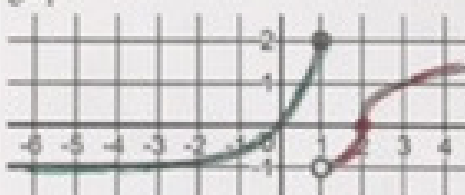
$$\frac{80}{1-\frac{1}{4}} = \frac{320}{3} = 106.\overline{66}$$

Write the equation for this graph.



$$y = -|x-2| + 3$$

Write the equation for this piecewise graph.



$$f(x) = \begin{cases} 1(3)^x - 1, & x \leq 1 \\ \sqrt[3]{x-2}, & x > 1 \end{cases}$$

You have space for 20 kids and 10 adults at a party. It costs \$8 for an adult and \$3 for a kid. You don't want to spend more than \$80. Write a system of inequalities for this scenario.

$k$  kids  $a$  = # adults  
 $k \leq 20$  and  $a \leq 10$   
 $8a + 3k \leq 80$

Solve for  $x$ :  $36^{7x-5} = 6^{9-x}$

$$(6^2)^{7x-5} = 6^{9-x}$$

$$6^{14x-10} = 6^{9-x}$$

$$14x - 10 = 9 - x$$

$$\frac{15x}{15} = \frac{19}{15}$$

$$\boxed{x = \frac{19}{15}}$$

Solve for  $x$ :  $\left(\frac{1}{81}\right)^x = 27$

$$(3^{-4})^x = 3^3$$

$$3^{-4x} = 3^3$$

$$\frac{-4x}{-4} = \frac{3}{-4}$$

$$\boxed{x = -\frac{3}{4}}$$