

Today's Plan:

Learning Target (standard): I will review for the semester exam.

Students will: Complete practice problems over previous concepts at the boards and study for my exam.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of exam problems.

Assessment: Board work

Differentiation: Students will work at the board, actively engage in practice review concepts with the aid of other students and the teacher.

p.295 #4-52 (by 4)

4) Beth - Bob

Diane - Dave

Marcia - John & Chuck

*not a function

8a) $\{(2,1),(8,2),(18,3),(32,4)\}$

b) Inverse is a function

12) NOT 1-1

$$*32) f^{-1}(x) = -\frac{1}{4}x$$

$$*36) f^{-1}(x) = \sqrt[3]{x-1}$$

$$*40) f^{-1}(x) = -\frac{3}{x}$$

$$*44) f^{-1}(x) = \frac{2x-4}{x}$$

$$*48) f^{-1}(x) = \frac{1}{x-3}$$

$$*52) f^{-1}(x) = \frac{2x-4}{x+3}$$

* These needed to be verified as well! *

$$44) f(x) = \frac{4}{2-x}$$

$$f^{-1}(x) = \frac{2x-4}{x}$$

Verify:

$$f(f^{-1}(x)) = \frac{4}{2 - \frac{2x-4}{x}} = \frac{4}{\frac{2x}{x} - \frac{2x-4}{x}}$$

$$= \frac{4}{\frac{4}{x}} = 4 \cdot \frac{x}{4} = x \checkmark$$

$$f^{-1}(f(x)) = \frac{2\left(\frac{4}{2-x}\right) - 4}{\frac{4}{2-x}} = \frac{\frac{8}{2-x} + \frac{-8+4x}{2-x}}{\frac{4}{2-x}}$$

$$= \frac{4x}{2-x} = \frac{\cancel{4x} \cdot \cancel{2-x}}{\cancel{2-x} \cdot \cancel{4}}$$

$$\therefore \rightarrow \frac{4}{2-x}$$

Use synthetic division to tell whether the given value is a zero of the function. Write the quotient and remainder.

$$f(x) = x^4 + 3x^3 - 21x^2 - 22x - 19; \boxed{x = -6} \quad (x+6)$$

$$\begin{array}{r|rrrrr} -6 & 1 & 3 & -21 & -22 & -19 \\ & & -6 & 18 & 18 & 24 \\ \hline & 1 & -3 & -3 & -4 & 5 \end{array}$$

$$x^3 - 3x^2 - 3x - 4 + \frac{5}{x+6}$$

\therefore By synthetic division,
 $x = -6$ is not a zero of $f(x)$
 because there is a remainder of 5.

Factor and find all zeros.

$$f(x) = 6x^5 + 3x^4 - 2x^3 - x^2 - 8x - 4$$

$$f(x) = 3x^4(2x+1) - x^2(2x+1) - 4(2x+1)$$

$$f(x) = (2x+1)(3x^4 - x^2 - 4) \quad \begin{array}{l} x^2+1=0 \\ x^2=-1 \end{array}$$

$$f(x) = (2x+1)(3x^2 - 4)(x^2 + 1)$$

$$f(x) = (2x+1)(\sqrt{3}x+2)(\sqrt{3}x-2)(x+i)(x-i)$$

$$\text{zeros: } x = -\frac{1}{2}, -\frac{2\sqrt{3}}{3}, \frac{2\sqrt{3}}{3}, -i, i$$