

## Functions Homework #2

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In this homework  $[x]$  denote the greatest integer function

1. Let  $\{x\} = x - [x]$  denote the fractional part of  $x$ . If  $z = \frac{\{\sqrt{3}\}^2 - 2\{\sqrt{2}\}^2}{\{\sqrt{3}\} - 2\{\sqrt{2}\}}$  what is  $[z]$

2. Which values of  $x$  must be excluded from the domain of  $g(x) = \frac{\frac{2}{2+x}}{2 - \frac{2}{2+x}}$

3. Let  $f$  be the real-number function defined by:  $f(x) \begin{cases} x+2 & \text{if 3 is a divisor of } [x] \\ x-1 & \text{otherwise} \end{cases}$  what is  $f(f(f(f(f(\pi)))))$

4. If  $f(2x) = \frac{2}{2+x}$  for all  $x > 0$  then find  $2f(x)$

\*\*5. Given that  $f(ax) = af(x)$  for all real numbers  $a$  and  $f(2) = 5$  find  $f(17)$

\*\*6. Find all solutions for  $f(x)$  if  $21f(x) + 7f\left(\frac{1}{x}\right) = 12x$

Today's Quiz

1. If  $f(x) = \frac{4}{x-1}$  and  $g(x) = 2x$  find all values of  $x$  such that  $f(g(x)) = g(f(x))$

2. If  $f(x-2) = x^2 - 5x + 4$  then  $f(x+1) =$

3. If  $f(x^2+1) = x^4 + 6x^2 + 2$  then  $f(x^2) =$