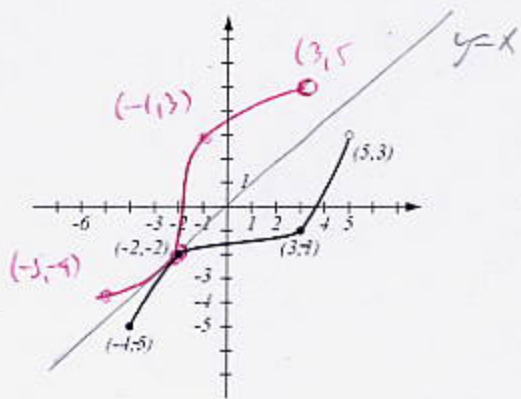


1. (6pts) The graph of a function f is given.

- a) Is this function one-to-one? Justify.
b) If the function is one-to-one, find the graph of f^{-1} , labeling the relevant points.



- a) Yes - it passes the horizontal line test
b) red graph

2. (12pts) Let $g(x) = \frac{3x}{2x-3}$. Find the formula for g^{-1} . Find the domain and range of g^{-1} .

$$y = \frac{3x}{2x-3}$$

$$(2x-3)y = 3x$$

$$2xy - 3y = 3x$$

$$2xy - 3x = 3y$$

$$x(2y-3) = 3y$$

$$x = \frac{3y}{2y-3}$$

$$g^{-1}(y) = \frac{3y}{2y-3}$$

Domain of g^{-1} :

can't have

$$2y-3=0$$

$$y = \frac{3}{2}$$

Domain = $\{y \mid y \neq \frac{3}{2}\}$

= $(-\infty, \frac{3}{2}) \cup (\frac{3}{2}, \infty)$

Range of g^{-1}

= domain of g

can't have

$$2x-3=0$$

$$x = \frac{3}{2}$$

Range = $\{x \mid x \neq \frac{3}{2}\}$

= $(-\infty, \frac{3}{2}) \cup (\frac{3}{2}, \infty)$

3. (8pts) Evaluate without using the calculator:

$$\log_2 32 = 5 \quad \log_9 \frac{1}{81} = -2 \quad \log_{81} 3 = \frac{1}{4} \quad \log_c \sqrt[6]{c^{11}} = \frac{11}{6}$$

$$2^5 = 32 \quad 9^{-2} = \frac{1}{81} = \frac{1}{9^2} = 9^{-2} \quad 81^{\frac{1}{4}} = 3 = \sqrt[4]{81} = 81^{\frac{1}{4}} \quad c^{\frac{11}{6}} = \sqrt[6]{c^{11}} = c^{\frac{11}{6}}$$

4. (4pts) Use your calculator to find $\log_5 100$ with accuracy 6 decimal places. Show how you obtained your number.

$$\log_5 100 = \frac{\log 100}{\log 5} = \frac{2}{0.69897} = 2.861353$$

5. (6pts) If you invest \$4,000 in an account bearing 4.15%, compounded daily, how much is in the account in 3 years?

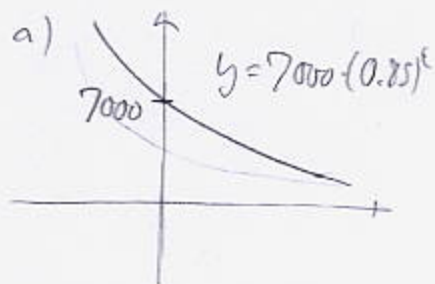
$$P = 4000 \left(1 + \frac{0.0415}{365}\right)^{365 \cdot 3} = 4000 (1.000113)^{1095} = 4000 \cdot 1.1325 \dots = 4530.30$$

6. (3pts) Find the domain of $f(x) = \log_5(3x - 1)$.

Must have $3x - 1 > 0$
 $3x > 1 \quad \left(\frac{1}{3}, \infty\right)$
 $x > \frac{1}{3}$

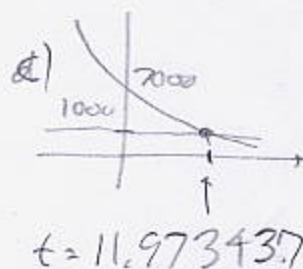
7. (9pts) A restaurant purchased a six-burner range for \$7,000. The value of the range each year is 85% of the value of the preceding year, so its value after t years is given by $V(t) = 7000(0.85)^t$.

a) Sketch the graph of $V(t)$.



b) Find the value of the range after 0, 2 and 5 years.

t	V(t)
0	7000
2	5057.50
5	3105.94



8. (12pts) Using transformations, draw the graphs of $f(x) = 1 - 2 \cdot 3^x$ and $g(x) = 2 \log x + 4$. Explain how you transform graphs of basic functions in order to get the graphs of f and g .

