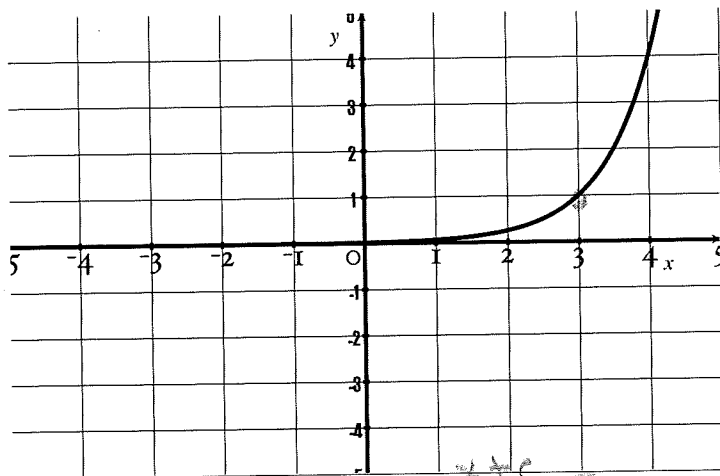


Quiz 4

Key

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz.

1. Let $g(x)$ be the function graphed to the right.



(a) [1] Find the range of g .

$(0, \infty)$ (1.5)
y-values (1.5)

(b) [3] (Exp Wks #3) Given that $g(x)$ is an exponential function of the form $y = b^x$ that has been horizontally shifted and graphed to the right. Find the equation.

thru $(3, 1)$

so $1 = b^{3+c}$
 $\log 1 = \log b^{3+c}$
 $0 = (3+c) \cdot \log b$
 $3+c = 0$ or $\log b = 0$
 $c = -3$ (1) answer

looks like $y = b^{x+c}$ (1)
thru $(4, 4)$ (normally passes thru $(0, 1)$)
so shifted \rightarrow 3 units

so $4 = b^{4+c}$ or so $x-3$ (1)
 $4 = b^{4-3}$
 $4 = b^1$ (1)
so $y = 4^{x-3}$

passes thru $(4, 4)$ so
 $4 = b^{4-3} \Rightarrow 4 = b$

so $y = 4^{x-3}$ (1)

2. [2] (§3.2 #48) Find x given $\log_8 \sqrt[3]{2-x} = \frac{1}{3}$

(1) $\log_8 \sqrt[3]{2-x} = \frac{1}{3}$
 $8^{\frac{1}{3}} = \sqrt[3]{2-x}$
(1.5) $8^{\frac{1}{3}} = (2-x)^{\frac{1}{3}}$
 $8 = 2-x$
 $x = -6$
(1.5) $x+8 = 2$
 $x = -6$

or $\log_8 \sqrt[3]{2-x} = \frac{1}{3}$
(1) $\sqrt[3]{2-x} = 8^{\frac{1}{3}}$
(1.5) $(2-x)^{\frac{1}{3}} = 8^{\frac{1}{3}}$
 $x = -6$

or $\log_8 \sqrt[3]{2-x} = \frac{1}{3}$
(1.5) $\log_8 (2-x)^{\frac{1}{3}} = \frac{1}{3}$
 $\frac{1}{3} \log_8 (2-x) = \frac{1}{3}$
(1) $\log_8 (2-x) = 1$
(1.5) $8^1 = 2-x$
 $x = -6$

3. Consider \$1,400 invested in an account with continuous compounding and a promised annual rate of return of .03%.

(a) [2] (Log Wks #1) Find a function that returns the total money in the account after t years.

$$\text{\$ after } t \text{ years} = \frac{1400}{1.5} e^{.0003t}$$

Per form (1.5)

(b) [2] (WebHW19 #15) How long does it take for the money to reach \$3,000?

$$3000 = \frac{1400}{1.5} e^{.0003t}$$

$$\frac{3000}{1400} = e^{.0003t}$$

or

$$\frac{3000}{1400}$$

use ln (1.5)
use right (1.5)

$$\ln \frac{3000}{1400} = \ln e^{.0003t}$$

$$\ln \frac{3000}{1400} = .0003t$$

$$\frac{\ln \frac{3000}{1400}}{.0003} = t$$

2.05