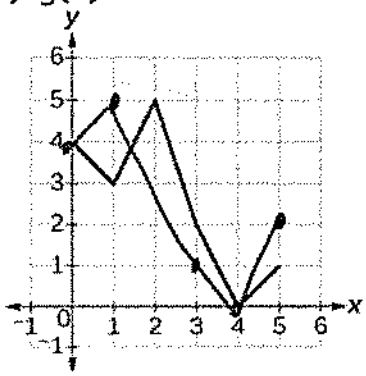
A2: Unit 7 and Unit 8 Review

Answers

No Calculator

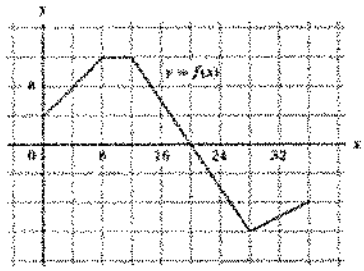
1) g(x) is shown below. Sketch the inverse on the same coordinate axes.



No, fails HLT
(g(x) is not a 1:1 function)

Is the inverse a function? Explain.

Evaluate given f(x), h(x), m(x), and p(x).



$h(x) = x^{2/3}$ $\quad m(x) = \frac{1}{x}$ $\quad p(x) = x^2 - x + 2$

2) $(f+h)(8)$ 16

3) $(m \circ f)(28)$ 1/12

4) $\left(\frac{f}{p}\right)(4)$ 4/7

5) $(m(p(x))$ $1/(x^2-x+2)$

6) $(m \cdot p)(x)$ $\frac{x^2-x+2}{x}$

7) Show that $f(x) = \sqrt[3]{x+7}$ and $g(x) = x^3 - 7$ are inverses of each other. Prove algebraically.

$(f \circ g)(x) = \sqrt[3]{x^3-7+7} = \sqrt[3]{x} = x$

$(g \circ f)(x) = (\sqrt[3]{x+7})^3 - 7 = x+7-7 = x$

$(f \circ g)(x) = (g \circ f)(x) = x$

Find the inverse of the function.

8a) $t(x) = 2^x - 5$

$t^{-1}(x) = \log_2(x+5)$

8b) $q(x) = \log_3(x-1)$

$q^{-1}(x) = 3^x + 1$

Evaluate.

9) $\log_7 \frac{1}{49}$ -2	10) $\log_4 64$ 3
11) $\log_{121} 11$ $1/2$	12) $5^{\log_5 3} + \log_2 2^5$ 8
13) $\ln 1 + \log_5 5$ 1	14) $\log_{1/2} 16$ -4
15) $\log_{32} 128$ $7/5$	16) $\log_{15} 1$ 0
17) $\log_2 16$ 4	18) $\log_5 \frac{1}{625}$ -4
19) $\log_{81} 27$ $3/4$	20) $\log_{1/3} \frac{1}{9}$ 2

Between which two consecutive integers does each expression lie?

21) $\log_6 50$ 2 and 3	22) $\log_4 \frac{1}{10}$ -1 and -2

Rewrite using change of base formula.

23) $\log_6 50$ (use common logs) $\frac{\log 50}{\log 6}$	24) $\log_4 \frac{1}{10}$ (use natural logs) $\frac{\ln \frac{1}{10}}{\ln 4}$

Expand. Simplify if possible.

25) $\log_9 (9x^2 y)$ $1 + 2\log_9 x + \log_9 y$	26) $\ln\left(\frac{ab^2}{c}\right)^4$ $4\ln a + 8\ln b - 4\ln c$
27) $\log_3 \sqrt{27x^4y^3}$ $\frac{3}{2} + 2\log_3 x + \frac{3}{2}\log_3 y$	28) $\log_5\left(\frac{x+2}{25}\right)$ $\log_5(x+2) - 2$

Condense. Simplify if possible.

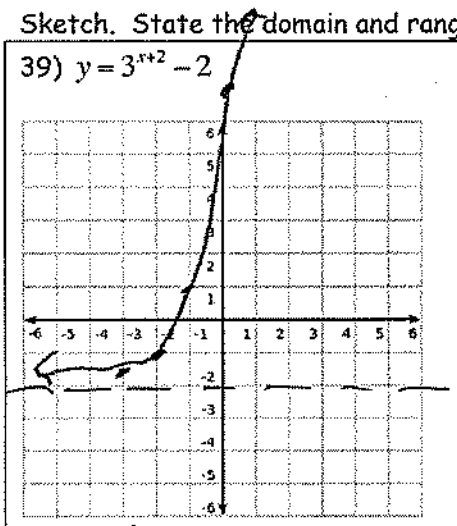
29) $5\log x - 7\log y - 8\log z$ $\log \frac{x^5}{y^7 z^8}$	30) $\ln(x-4) + \ln(x)$ $\ln(x^2 - 4x)$
31) $3\log_{12} x - 3\log_{12} y$ $\log_{12} \frac{x^3}{y^3} = \log_{12}\left(\frac{x}{y}\right)^3$	32) $\log 5 + \log 20$ $\log 100 = 2$

Solve. Check for extraneous solutions for log equations.

33) $\log(5x)-\log(x-1)=\log(2)$ $\emptyset$	34) $\log_5(5x-7)=\log_5(2x+5)$ 4	35) $\log_2(x-5)=3$ 13
36) $7^{5-x}=\left(\frac{1}{49}\right)^x$ -5	37) $16^{x+2}=64^{x+5}$ -11	38) $\log_3 x+\log_3(x-6)=3$ 9

Sketch. State the domain and range.

39) $y=3^{x+2}-2$



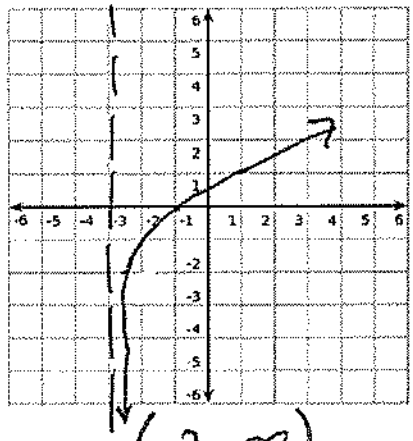
x	y
-3	$-1\frac{2}{3}$
-2	-1
-1	1
0	7

Domain $\{x \mid x \in R\}$ (set notation)

Range $\{y \mid y > -2\}$ (set notation)

40) $y=\log_2(x+3)-1$

$2^{y+1}-3=x$



x	y
$-2\frac{1}{2}$	-2
-2	-1
-1	0
1	1

Domain $(-3, \infty)$ (interval notation)

Range $(-\infty, \infty)$ (interval notation)

Calculator questions

Solve. Round to 3 decimal places.

41) $7^{x-5}=72$ 7.198	42) $3\cdot 10^x-1=11$ .602
43) $\ln\sqrt{x+5}=3$ 398.429	44) $e^{2x}=30$ 1.701

Evaluate. Round to 3 decimal places.

45) $\log_5 407$ 3.733	46) $\log_{1/2} 14$ -3.807

Set up an equation then solve.

47) If $10,000 is invested at 5% compounded monthly, how much will be in the account after 4 years? Round to the nearest penny.

$12208.95

48) How long will it take to double your money at 7% compounded continuously? Round to three decimal places.

9.902 years

49) If $10,000 is invested at 7.3% compounded continuously, how much will be in the account after 12 years? Round to the nearest penny.

$24012.75

50) If the ending balance of an account is $32,155, what was the beginning balance if the investment had a rate of 8% compounded continuously for 7 years? Round to the nearest penny.

$18367.23