Answer Sheet

1	$\{x \mid x \geq 0\}$	12	$f^{-1}(x) = \frac{8x+3}{x}$	23	$4x^2+4x-7$
2	23	13	$\{x \mid x \geq -12\}$	24	$2x^2-15$
3	$3t^2+6t-4$	14	4	25	3
4	$f^{-1}(x) = \sqrt{\frac{x+4}{3}}$	15	$\sqrt{3t+10}$	26	-1
5	$\mathbb{R}$	16	$f^{-1}(x) = x^2-12$	27	4
6	5	17	$\mathbb{R}$	28	0
7	$2t-11$	18		29	125
8	$f^{-1}(x) = \frac{x+7}{2}$	19	$f^{-1}(x) = \ln(x)$	30	$\frac{1}{16}$
9	$\{x \mid x \neq 0\}$	20	13,600.05	31	86
10	$-\frac{3}{2}$	21	15,374.91	32	3
11	$\frac{3}{2t-7}$	22	16,068.43	33	Solutions

32 ✓

East Los Angeles College
Department of Mathematics
Math 125
Test 4

Let $f(x) = 3x^2 - 4$ for $x \geq 0$

Determine:

1. The domain of the function.
2. $f(3)$
3. $f(t+1)$
4. The Inverse of this function. Note the function is one to one.

Let $f(x) = 2x - 7$

Determine:

5. The domain of the function.
6. $f(0)$
7. $f(t-2)$
8. The inverse of this function. Note the function is one to one.

Let $f(x) = \frac{3}{x-8}$

Determine:

9. The domain of the function.
10. $f(6)$
11. $f(2t+1)$
12. The inverse of this function. Note the function is one to one.

Let $f(x) = \sqrt{x+12}$

Determine:

13. The domain of the function.
14. $f(4)$
15. $f(3t-2)$
16. The inverse of this function. Note the function is one to one.

Let $f(x) = e^x$

Determine:

17. The domain of the function.
18. Sketch the curve and its inverse.
19. Determine the inverse of this function.

A student invests $ 800 for 25 years at an annual interest rate of 12%. How much money will this grow if interest is compounded:

20. Annually?
21. Quarterly?
22. Continuously?

Let $f(x) = x^2 - 8$ and $g(x) = 2x + 1$

Determine:

23. $(fog)(x)$
24. $(gof)(x)$

Determine the exact values without using a calculator.

25. $log_2(8)$
26. $log_5\left(\frac{1}{5}\right)$
27. $log_3(81)$
28. $log_7(1)$

Determine the value of x

29. $log_5(x) = 3$
30. $log_4(x) = -2$
31. $log_3(x - 5) = 4$
32. $log_{100}(x + 7) = \frac{1}{2}$

33. What is your name?

math 262 Test 4

(1) $\{x \mid x \geq 0\}$

(2) $f(3) = 3 \cdot 3^2 - 4$

$= 3 \cdot 9 - 4$

$= 27 - 4$

$= 23$

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

$= 3(t+1)(t+1) - 4$

$= 3(t^2 + 2t + 1) - 4$

$= 3t^2 + 6t + 3 - 4$

$= 3t^2 + 6t - 4$

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

① $y = 3x^2 - 4$

② $x = 3y^2 - 4$

③ $3y^2 - 4 = x$

$+4 \quad +4$

$3y^2 = x + 4$

$y^2 = \frac{x+4}{3}$

$y = \pm \sqrt{\frac{x+4}{3}}$

$y = \sqrt{\frac{x+4}{3}}$

④ $f^{-1}(x) = \sqrt{\frac{x+4}{3}}$

(5) $f(x) = 2x - 7$ linear

$D = \mathbb{R}$

(6) $f(6) = 2 \cdot 6 - 7$

$= 12 - 7$

$= (5)$

(7) $f(t-2) = 2(t-2) - 7$

$= 2t - 4 - 7$

$= 2t - 11$

(8) $f(x) = 2x - 7$

① $y = 2x - 7$

② $x = 2y - 7$

③ $2y - 7 = x$
$+7 \quad +7$

$\frac{2y}{2} = \frac{x+7}{2}$

$y = \frac{x+7}{2}$

(4) $f^{-1}(x) = \frac{x+7}{2}$

(9) $f(x) = \frac{3}{x-8}$

$x - 8 = 0$; $x = 8$

$D = \{x \mid x \neq 8\}$

(10) $f(6) = \frac{3}{6-8}$

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

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

(11) $f(2t+1) = \frac{3}{2t+1-8}$

$= \frac{3}{2t-7}$

(12) $f(x) = \frac{3}{x-8}$

(i) $y = \frac{3}{x-8}$

(2) $x = \frac{3}{y-8}$

(3) $\frac{3}{y-8} = x$

$3 = x(y-8)$

$3 = xy - 8x$

$\frac{3+8x}{x} = \frac{xy}{x}$

$y = \frac{3+8x}{x}$

$f^{-1}(x) = \frac{8x+3}{x}$

(13) $f(x) = \sqrt{x+12}$

$x+12 \geq 0$; $x \geq -12$
$-12 \quad -12$

$D = \{x \mid x \geq -12\}$

(14) $f(4) = \sqrt{4+12}$

$= \sqrt{16}$

$= 4$

(15) $f(3t-2) = \sqrt{3t-2+12}$

$= \sqrt{3t+10}$

(16) $f(x) = \sqrt{x+12}$

① $y = \sqrt{x+12}$

② $x = \sqrt{y+12}$

③ $\sqrt{y+12} = x$

$(\sqrt{y+12})^2 = x^2$

$y+12 = x^2$
$-12 \quad -12$

$y = x^2 - 12$

④ $f^{-1}(x) = x^2 - 12$

(17) $f(x) = e^x$; $D = \mathbb{R}$

(18) No graph paper

(19) $f(x) = e^x$

(1) $y = e^x$

(2) $x = e^y$

(3) $e^y = x$

$\ln(e^y) = \ln(x)$

$y \ln(e) = \ln(x)$

$y = \ln(x)$; $f^{-1}(x) = \ln(x)$

(20) $A_0 = 800$; $t = 25$; $r = 0.12$

annually $n = 1$; $A = A_0\left(1 + \frac{r}{n}\right)^{nt}$

$A = 800\left(1 + \frac{0.12}{1}\right)^{1 \cdot 25}$

$A = 800(1.12)^{25}$; $\boxed{A \approx 13,600.05}$

(21) Quarterly ; $n = 4$

$A = 800\left(1 + \frac{0.12}{4}\right)^{4 \cdot 25}$

$A = 800(1.03^{100})$; $\boxed{A \approx 15,374.91}$

(22) $A = A_0 e^{rt}$

$= 80 e^{0.12 \cdot 25}$

$= 80 e^{3}$

$\approx \boxed{16,068.43}$

(23) $(f \circ g)(x) = f[g(x)]$

$= f[2x+1]$

$= (2x+1)^2 - 8$

$= (2x+1)(2x+1) - 8$

$= 4x^2 + 4x + 1 - 8$

$= 4x^2 + 4x - 7$

(24) $(g \circ f)(x) = g[f(x)]$

$= g[x^2 - 8]$

$= 2(x^2 - 8) + 1$

$= 2x^2 - 16 + 1$

$= 2x^2 - 15$

(25) $\log_2(8) = y$

$2^y = 8$, $y = 3$

(26) $\log_5\left(\frac{1}{5}\right) = y$

$5^y = \frac{1}{5}$; $5^y = 5^{-1}$; $y = -1$

(27) $\log_3(81) = y$;

$3^y = 81$; $3^y = 3^4$; $y = 4$

(28) $\log_7(1) = y$; $7^y = 1$; $y = 0$

(29) $\log_5(x) = 3$

$5^3 = x$; $x = 125$

(30) $\log_4(x) = -2$; $4^{-2} = x$; $x = \frac{1}{4^2}$

$x = \frac{1}{16}$

(31) $\log_3(x-5) = 4$

$3^4 = x - 5$

$81 = x - 5$; $x = 86$
$+5 \quad +5$

(32) $\log_{100}(x+7) = \frac{1}{2}$; $100^{\frac{1}{2}} = x+7$

$x+7 = \sqrt{100}$; $x+7 = 10$; $x = 3$
$-7 \quad -7$