Ch 7 D-Day No Calculator Name: Key Group:____ Per:____

1. Sketch $f(x)=\log_4(x+3)+2$

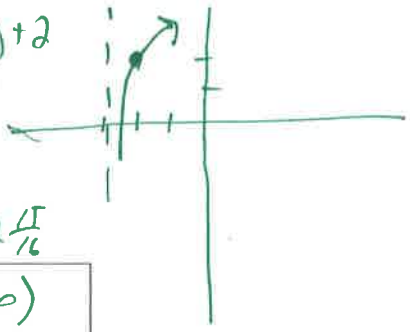
$0=\log_4(x+3)+2$

$-2=\log_4(x+3)$

$4^{-2}=(x+3)$

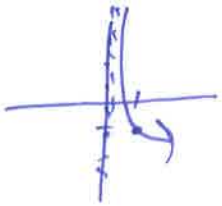
$\frac{1}{16}=x+3$

$-2\frac{15}{16}$



Domain: $(-3,\infty)$
x-intercept: $(-2\frac{15}{16},0)$
Vertical asymptote: $x=-3$

2. Sketch $f(x)=-\log_3 x-1$



$0=-\log_3 x-1$

$1=-\log_3 x$

$-1=\log_3 x$

$3^{-1}=x$

$\frac{1}{3}=x$

Domain: $(0,\infty)$
x-intercept: $(\frac{1}{3},0)$
Vertical asymptote: $x=0$

3. Find the inverse of $f(x)=9-\sqrt{2x+3}$

$x=9-\sqrt{2y+3}$

$x-9=-\sqrt{2y+3}$

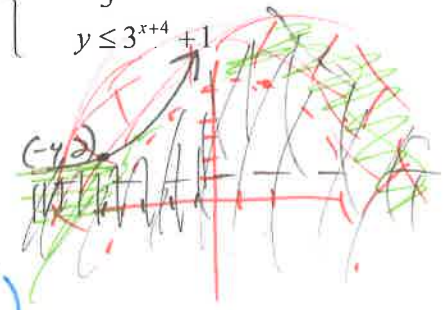
$[-(x-9)]^2=\sqrt{2y+3}^2$

$[-(x-9)]^2=2y+3$

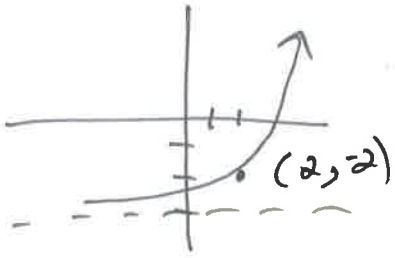
$\frac{[-(x-9)]^2-3}{2}=f^{-1}(x)$

4. Solve the system by graphing

$$\begin{cases} y>-\frac{1}{3}(x-2)^2+5 \\ y\le 3^{x+4}+1 \end{cases}$$



5. Graph $g(x)=5^{x-2}-3$



6. Solve for x: $x^{\frac{-2}{3}}=\frac{1}{9}$

$(x^{-2/3})^{-3/2}=(\frac{1}{9})^{-3/2}$

$x=(9)^{3/2}\Rightarrow(\sqrt{9})^3$

$x=(\pm 3)^3=\pm 27$

7. Write $7^{-2}=\frac{1}{49}$ as a logarithm

$\log_7\frac{1}{49}=-2$

8. Condense to a single logarithm.

$-5\log_5 w+8\log_5 y-\frac{1}{2}\log_5 k$

$\log_5\frac{y^8}{k^{\frac{1}{2}}w^5}$

$\log_5\left(\frac{y^8}{\sqrt{k}\,w^5}\right)$

9. Write $\log 34=1.53$ in exponential form.

$10^{1.53}=34$

10. **Evaluate** $\log_{25}125$.

$25^x=125$

$5^{2x}=5^3$

$2x=3$

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

11. Solve for x: $\frac{1}{16}^{x-2}=8$

$2^{-4(x-2)}=2^3$

$-4x+8=3$

$-4x=-5$

$x=\frac{5}{4}$

D-Day Ch 7 Calculator

1. $A = 33^\circ$, $a = 7$, $b = 8$. Find B.

① SSA ✓
② Acute ✓
③ B > 32
2 Δ's

$\frac{\sin 33}{7} = \frac{\sin B}{8}$

$38.49 = B$

or

$180 - 38.49 = 141.51 = B$

2. Find an exponential growth model ($y = ab^x$) whose graph passes through the points (2, 9.9) and (5, 267.3).

$9.9 = ab^2$ $\quad 267.3 = ab^5$

$\frac{9.9}{b^2} = a$

$267.3 = \frac{9.9}{b^2} \cdot b^5$

$\frac{9.9}{3^2} = a$

$267.3 = 9.9b^3$

$1.1 = a$

$27 = b^3$

$3 = b$

$y = 1.1(3)^x$

3. $3x - x^2 = \log_2 \frac{1}{16}$

$\log_2 \frac{1}{16} = y$

$2^y = \frac{1}{16}$

$2^y = 2^{-4}$

$y = -4$

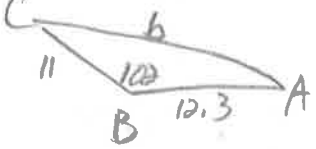
$3x - x^2 = -4$

$0 = x^2 - 3x - 4$

$0 = (x-4)(x+1)$

$x = 4$ or -1

4. Given $a = 11$, $c = 12.3$ and $B = 102^\circ$, find b.



$b^2 = 11^2 + 12.3^2 - 2(11)(12.3)\cos 102$

$b^2 = 328.55$

$b = 18.13$

5. $\log_2 9x = \log_2 (x-2) + \log_2 (x+10)$

$\log_2 9x = \log_2 (x-2)(x+10)$

$9x = x^2 + 8x - 20$

$0 = x^2 - x - 20$

$0 = (x-5)(x+4)$

$x = 5$ or -4

6. $3e^{2x} + 7e^x = -2$

Let $u = e^x$

$3e^{2x} + 7e^x + 2 = 0$

$3u^2 + 7u + 2 = 0$

$(3u+1)(u+2) = 0$

$u = -\frac{1}{3}$ $\quad u = -2$

ϕ

7. $\log_2 (x-1) = 3 - \log_2 (x+6)$

$\log_2 (x-1) + \log_2 (x+6) = 3$

$\log_2 (x-1)(x+6) = 3$

$2^3 = x^2 + 5x - 6$

$0 = x^2 + 5x - 14$

$(x+7)(x-2)$

$x = -7$ $\quad x = 2$

8. $\sqrt{3x+1} = x - 3$

$\sqrt{3x+1} = (x-3)^2$

$3x + 1 = x^2 - 6x + 9$

$0 = x^2 - 9x + 8$

$0 = (x-1)(x-8)$

$x = 1$ or 8

9. $3 \cdot 5^x = 12$

$5^x = 4$

$\log 5^x = \log 4$

$x \log 5 = \log 4$

$x = \frac{\log 4}{\log 5}$

$x = .8614$

10. $4^{\log_4 (3x-2)} = 10$

$\log_4 10 = \log_4 (3x-2)$

$10 = 3x - 2$

$3x = 12$

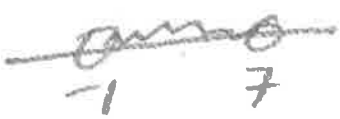
$x = 4$

11. $2|x-3| < 8$

$|x-3| < 4$

$x - 3 = 4$ $\quad x - 3 = -4$

$x = 7$ $\quad x = -1$



12. $6x^3 - 11x^2 + 3x = 0$

$x(6x^2 - 11x + 3) = 0$

$x(2x-3)(3x-1) = 0$

$x = 0$ $\quad x = \frac{3}{2}$, $x = \frac{1}{3}$