3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

33) a. $\log_5 125 = \log_5 5^3$

$= 3\log_5 5$

$= 3$

b. $\log_3 \frac{1}{27} = \log_3 27^{-1}$

$= -\log_3 27$

$= -\log_3 3^3$

$= -3\log_3 3$

$= -3$

35) a. $\log_2 6 - \log_2 15 + \log_2 20 = \log_2\left(\frac{6}{15}\right) + \log_2 20$

$= \log_2\left(\frac{6}{15}\right)\cdot 20$

$= \log_2 8$

$= \log_2 2^3$

$= 3\log_2 2$

$= 3$

b. $\log_3 100 - \log_3 18 - \log_3 50 = \log_3\left(\frac{100}{18}\right) - \log_3 50$

$= \log_3\left(\frac{100}{18\cdot 50}\right)$

$= \log_3 \frac{1}{9}$

$= \log_3 3^{-2}$

$= -2\log_3 3$

$= -2$

47) a. $2\ln x = 1$

$\ln x = 1/2$

$e^{\ln x} = e^{1/2}$

$x = e^{1/2} = \sqrt{e}$

b. $e^{-x} = 5$

$\ln(e^{-x}) = \ln 5$

$-x\ln e = \ln 5$

$x = -\ln 5$

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48) a. $e^{2x+3} - 7 = 0$

$e^{2x-3} = 7$

$\ln(e^{2x+3}) = \ln 7$

$(2x+3)\ln e = \ln 7$

$2x+3 = \ln 7$

$x = \frac{1}{2}(\ln 7 - 3)$

b. $\ln(5-2x) = -3$

$e^{\ln(5-2x)} = e^{-3}$

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

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

$x = \frac{1}{2}(5 - e^{-3})$

57) a. $f(t) = 100 \cdot 2^{t/3}$

$n = 100 \cdot 2^{t/3}$

$n/100 = 2^{t/3}$

$\log_2(n/100) = \log_2 2^{t/3}$

$\log_2(n/100) = t/3$

$3\log_2(n/100) = t$

The inverse tells us how long it will take to grow a population of size n.

b. $t = 3\log_2(n/100)$

$= 3\log_2\left(\frac{50000}{100}\right)$

$= 3\log_2 500$

$= 3\left(\frac{\ln 500}{\ln 2}\right)$

$t \approx 26.9$ hours

same answer we found graphically in section 1.5 #25

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59) a. $\sin^{-1}(\sqrt{3}/2)$

what is the angle whose sine is $\sqrt{3}/2$? $\frac{\pi}{3}$

$\sin^{-1}(\sqrt{3}/2) = \pi/3$

b. $\cos^{-1}(-1)$

What is the angle whose cosine is -1? π

$\cos^{-1}(-1) = \pi$

63) a. $\tan(\arctan 10)$

tan is the inverse of arctan $\therefore$ $\tan(\arctan 10) = \underline{10}$

b. $\sin^{-1}(\sin 7\pi/3)$

$= \sin^{-1}(\sin \pi/3)$

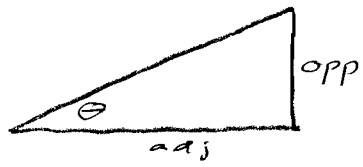
$= \sin^{-1}(\sqrt{3}/2)$

$= \pi/3$ since the range of $\sin^{-1}$ is $[-\pi/2, \pi/2]$

67) simplify $\sin(\tan^{-1}x)$

$\tan^{-1}x$ is the angle θ, whose tan is x

$\tan\theta$ is defined as $\frac{opp}{adj}$



we want $\tan\theta$ to equal x

so the triangle would be

therefore: $\sin\theta = \frac{opp}{hyp}$

$= \frac{x}{\sqrt{1+x^2}}$

$\sin(\tan^{-1}x) = \frac{x}{\sqrt{1+x^2}}$