Math 41
Quiz 6
Due Monday April 4th in class

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Use the appropriate formula: $A = P\left(1+\frac{r}{n}\right)^{nt}$ or $A = Pe^{rt}$

Find the amount in an account if $25,000 is deposited and earning 3% interest for 10 years and the interest is compounded,

a) monthly.

$A = P(1+\frac{r}{n})^{nt}$

$P = 25,000$ $t = 10$

$r = 0.03$

$n = 12$

$A = 25000\left(1+\frac{0.03}{12}\right)^{(12)(10)}$

$\approx 33,733.84$

b) continuously.

$P = 25,000$

$r = 0.03$

$t = 10$

$A = 25,000\, e^{(0.03)(10)}$

$\approx 33,746.47$

Evaluate and write the exponential in logarithmic form, or find the logarithm and write in exponential form.

Exponential Form	Logarithmic Form
$4^3 =$ 64	$\log_4 64 = 3$
$\left(\frac{2}{3}\right)^{-3} = \left(\frac{3}{2}\right)^3 = \frac{27}{8}$	$\log_{\frac{2}{3}} \frac{27}{8} = -3$
$e^3 \approx$ 20.09	$\ln 20.09 \approx 3$
$\sqrt[4]{e^5} \approx$ $e^{5/4} \approx 3.49$	$\ln 3.49 \approx 5/4$
$e^{-0.0125} \approx$ 0.99	$\ln 0.99 \approx -0.0125$

Exponential Form	Logarithmic Form
$2^4 = 16$	$\log_2 16 =$ 4
$5^{-3} = \frac{1}{125}$	$\log_5 \frac{1}{125} =$ -3
$\left(\frac{1}{4}\right)^{-1} = 4$	$\log_{\frac{1}{4}} 4 =$ -1
$e^2 = e^2$	$\ln e^2 =$ 2 $2\ln e$
$e^0 = 1$	$\ln 1 =$ 0

Use properties of logarithms to expand or condense.

Expand: $\ln\left(x\sqrt{x^2+5}\right)$ $1/2$

$\ln x + \ln(x^2+5)$

$\ln x + \frac{1}{2}\ln(x^2+5)$

Condense: $4\ln x - \frac{2}{3}\ln(2x+1)$

$\ln x^4 - \ln(2x+1)^{2/3}$

$\ln\left(\frac{x^4}{(2x+1)^{2/3}}\right) = \ln\left(\frac{x^4}{\sqrt[3]{(2x+1)^2}}\right)$

The number of burpees a Personal Trainer proposes for you at the end of your weekly sessions can be modeled by $N = \frac{72}{1+11e^{-0.25t}}$ where N is the number of burpees and t is the number of training sessions in which you have participated. Find the initial number of burpees, $t = 0$ and the approximate number after twelve weeks, $t = 12$.

Initial number

$N(0) = \frac{72}{1+11e^{(-0.25)(0)}}$

$= 6$

After 12 weeks

$N(12) = \frac{72}{1+11e^{(-0.25)(12)}}$

≈ 46