[4 PTS] Solve $\left(1+\frac{0.065}{365}\right)^{365t} = 4$. Find the exact solution.

Also, copy the exact solution onto the calculator portion of the quiz.

$$365t \ln\left(1+\frac{0.065}{365}\right) = \ln 4$$

$$t = \frac{\ln 4}{365 \ln\left(1+\frac{0.065}{365}\right)}$$

(2)

ANSWER: $\frac{\ln 4}{365 \ln\left(1+\frac{0.065}{365}\right)}$

(2)

[2 PTS] Solve $7 + 3\ln x = 5$. Find the exact solution(s).

Also, copy the exact solution onto the calculator portion of the quiz.

$$3\ln x = -2$$

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

$$x = e^{-\frac{2}{3}}$$

ANSWER: $e^{-\frac{2}{3}}$

[3 PTS] Find the exact values of the following expressions.

[a] $\log_5 75 - \log_5 3$ **ANSWER:** 2

$\log_5 \frac{75}{3} = \log_5 25 = 2$

[b] $\log_2 \sqrt[4]{8}$ **ANSWER:** $\frac{3}{4}$

$\log_2 8^{\frac{1}{4}} = \frac{1}{4}\log_2 8 = \frac{1}{4}(3) = \frac{3}{4}$

[c] $\ln e^2 + \ln e^5$ **ANSWER:** 7

$\ln(e^2 \cdot e^5) = \ln e^7 = 7$

[2 PTS] Write $\ln\left(x^2\sqrt{\frac{y}{z}}\right)$ as a sum, difference and/or constant multiple of logarithms of single variable.

ANSWER: $2\ln x + \frac{1}{2}\ln y - \frac{1}{2}\ln z$

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

$= 2\ln x + \frac{1}{2}(\ln y - \ln z)$

$= 2\ln x + \frac{1}{2}\ln y - \frac{1}{2}\ln z$

2

$-\frac{1}{2}$ EACH ERROR

[2 PTS] Write $\frac{1}{3}[\log_8 y + 2\log_8(y+4)] - \log_8(y-1)$ as a single logarithm.

ANSWER: $\log_8 \frac{\sqrt[3]{y(y+4)^2}}{y-1}$

$\frac{1}{3}[\log_8 y + \log_8 (y+4)^2] - \log_8(y-1)$

$= \frac{1}{3}\log_8 y(y+4)^2 - \log_8(y-1)$

$= \log_8 \sqrt[3]{y(y+4)^2} - \log_8(y-1) = \log_8 \frac{\sqrt[3]{y(y+4)^2}}{y-1}$

2

$-\frac{1}{2}$ EACH ERROR

[5 PTS] Solve $\log 5x + \log(x-1) = 2$. Find the exact solution(s).

ANSWER: $x = 5$

$\log 5x(x-1) = 2$

$5x(x-1) = 10^2 = 100$

$x(x-1) = 20$

$x^2 - x - 20 = 0$

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

$x = 5, -4$

$\frac{1}{2}$

CHECK:

$x = 5$ $\log 25 + \log 4 = \log 100 = 2$

$x = -4$ $\log(-20)$

[1 PTS] Solve $\left(1+\frac{0.065}{365}\right)^{365t}=4$.

ANSWER: 21.3295

Use your calculator to find the decimal approximation of your exact solution, rounded to 4 decimal places.

[1 PTS] Solve $7+3\ln x=5$.

ANSWER: 0.5134

Use your calculator to find the decimal approximation of your exact solution, rounded to 4 decimal places.