Shaun Lewis Quiz 2 9/5/2016

1.

$$\log(25x^2-25) - \log(x-1) = 2$$

$$\log_{10}\left(\frac{25x^2-25}{x-1}\right) = 2 \rightarrow 10^2 = \left(\frac{25x^2-25}{x-1}\right)$$

$$(x-1)100 = \left(\frac{25x^2-25}{x-1}\right)(x-1)$$

$$100(x-1) = 25x^2-25$$

$$100x - 100 = 25x^2 - 25$$

$$+100 \qquad +100$$

$$100x = 25x^2 + 75$$

$$-100x \qquad -100x$$

$$0 = 25x^2 - 100x + 75$$

$$25[x^2 - 4x + 3]$$

$$25[(x-1)(x-3)] \rightarrow 0 = 25(x-1)(x-3)$$

$$25(x-1) = 0$$

$$25x - 25 = 0$$

$$+25 \quad +25$$

$$\frac{25x}{25} = \frac{25}{25} \rightarrow x = 1$$

$$x - 3 = 0$$

$$+3 = +3$$

$$x = 3$$

TEST x

1. (cont)

$x = 1$

$\log(25(1)^2 - 25) - \log(1-1) = 2$

$\log(25 - 25) - \log(1-1) = 2$

$\log(0) - \log(0) = 2$ $x = 1$ is erroneous

undef undef

$x = 3$

$\log(25(3)^2 - 25) - \log(3-1) = 2$

$\log(25(9) - 25) - \log(2) = 2$

$\log(225 - 25) - \log(2) = 2$

$\log(200) - \log(2) = 2$

$\log\left(\frac{200}{2}\right) = 2$

$\log_{10}\left(\frac{200}{2}\right) = 2 \rightarrow 10^2 = \left(\frac{200}{2}\right)$

$10^2 = (100)$

$100 = 100$

$x = 3$ is a valid answer for

$\log(25x^2 - 25) - \log(x-1) = 2$

2.

$h(t) = 397.68 \ln(t) - 2955.1$, where $t = 1990$

$h(t)$ = home-ownership rate

$h(1990) = 397.68 \ln(1990) - 2955.1$

$\downarrow$

$(397.68) \cdot \ln(1990) - 2955.1$

$\downarrow$

$(397.68)(7.59589) - 2955.1$

$\downarrow$

$3020.73 - 2955.1$

$\downarrow$

$\approx$

$65.63\% \rightarrow 66.60\%$

$\boxed{h(1990) = 66.60\%}$

The home-ownership rate in 1990 was 66.60%

3a. $Q = A\left(1 + \frac{r}{n}\right)^{n+}$

Q- Amount of money at end of time period

A- Initial Amount of Money Invested
r- Interest Rate
n- number of compounding periods (monthly)
+- number of years invested

A: 5000
r: 3% → .03
n: 12
+: 20

$$Q = 5000\left(1 + \frac{.03}{12}\right)^{12 \cdot 20}$$

$$5000\left(1 + .0025\right)^{12 \cdot 20} \longrightarrow 9103.77 \text{ (unrounded answer)}$$

$$5000\left(1.0025\right)^{12 \cdot 20}$$

$$5000\left(1.0025\right)^{240}$$

$$5000\left(1.82075\right)$$

$$\boxed{9103.75}$$

$9103.75 will be available in account after 20 years compounded monthly.

3b. $A = Pe^{rt}$

A : Amount	
P : Principal	5000
e : 2.71828 (constant)	2.71828
r : rate	3% = .03
t : time	20

$A = (5000)(2.71828)^{(.03)(20)}$

$(5000)(2.71828)^{.6}$

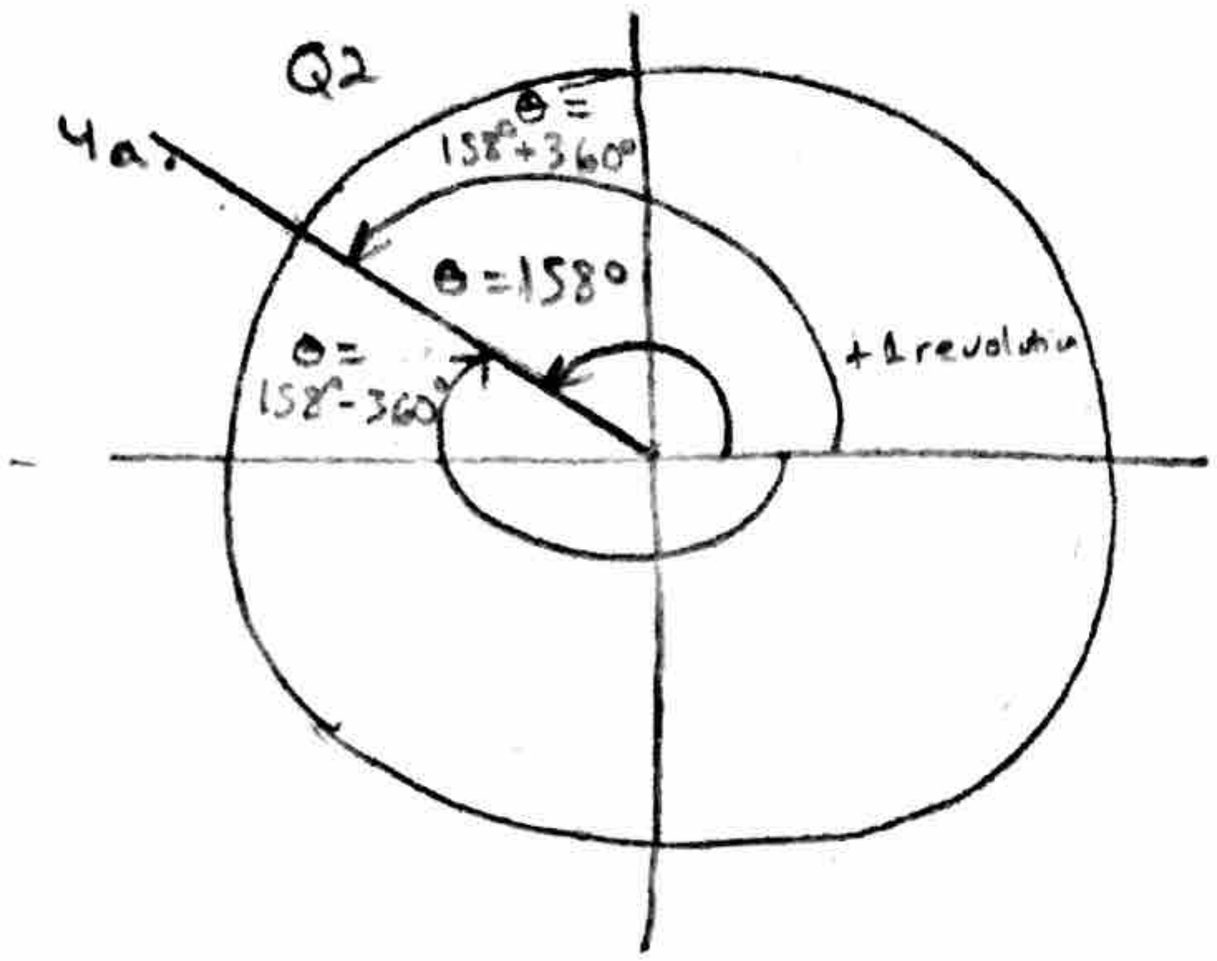
$(5000)(1.82212)$

↓

$9110.59

$9110.59 will be available in account after 20 years compounded continuously.

$\theta = (\text{Radian}) + 2\pi k$
or
degree or 360°



158° is located in quadrant 2

4b. $\theta = (158°) + (360°)(1)$

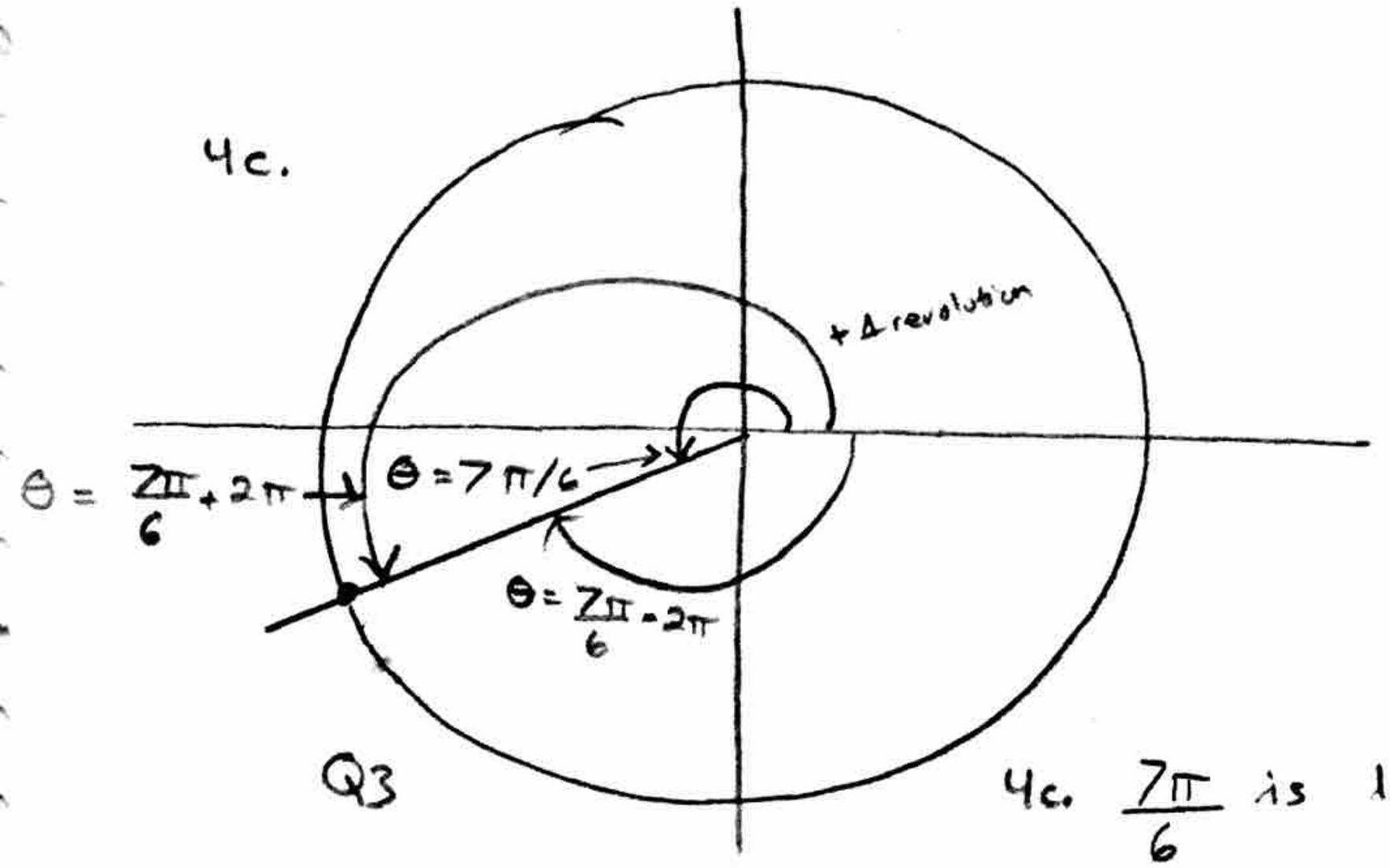
$(158°) + 360°$

$\theta = 518°$

$\theta = (158°) - (360°)(1)$

$\theta = 158° + (-360°)$

$\theta = -202°$



4c. $\frac{7\pi}{6}$ is located in quadrant 3.

4d. $\theta = \left(\frac{2\pi}{6}\right) + (2\pi)(1)$

$\frac{2\pi}{6} + 2\pi$

$\theta = 19\pi/6$ or $570°$

$\theta = \left(\frac{2\pi}{6}\right) - (2\pi)(1)$

$\left(\frac{2\pi}{6}\right) - 2\pi$

$\theta = -5\pi/6$ or $-150°$

5a. $\frac{225^{5}}{1}\left(\frac{\pi}{180^{4}}\right) \rightarrow \frac{5\pi}{4}$

$$225^\circ = \frac{5\pi}{4}$$

Find GCF for 5a.

225

180

$5 \cdot (3^2) = 45$

5b. $\frac{11\pi}{6}\left(\frac{180^{30}}{\pi}\right) = \frac{(11 \cdot 30)}{1} = 330^\circ$