Review for Exam 3

If $7^x = 3$, then x is equal to

1) $(\log 3)(\log 7)$
2) $\log 3 - \log 7$
3) $\dfrac{\log 3}{\log 7}$
4) $\dfrac{\log 7}{\log 3}$

a) Find the exact solution of the equation: $6^{x+2} = 7^x$

b) Use the calculator to approximate your solution from part (a).

In 2020, the population of a city was 15,000, and it is increasing exponentially at 2% per year.

(a) What will the population be after 6 years?

(b) In what year will the population double?

a) $\sin(75°)$ b) $\cos(15°)$ c) $\tan(105°)$

e) $\cos(345°)$ f) $\sin(15°)$ g) $\cos(285°)$

a) $\cos(22.5°)$

e) $\sin(7.5°)$

Find the amplitude, period, and phase shift of the function. Use this information to graph the function over a full period. Label all roots, maxima, and minima of the function.

a) $y = 5\cos(2x)$ b) $y = -4\sin(\pi x)$ c) $y = 4\sin(5x - \pi)$

Solve for x. State the general solution without approximation.

a) $\tan(x) - 1 = 0$ b) $2\sin(x) = 1$ c) $2\cos(x) + \sqrt{3} = 0$

Write the expression as one of the six trigonometric functions.

b) $\sec(x) \cdot \cot(x)$

e) $\dfrac{\cot(x)}{\csc(x)}$

Simplify the expression as much as possible.

a) $\dfrac{\cos^2(x)-1}{\sin(x)}$ b) $\dfrac{1-\sin^2(x)}{\cot(x)}$

Find the exact values of the trigonometric functions of $\frac{\alpha}{2}$ and of 2α by using the half-angle and double-angle formulas.

c) $\sin(\alpha) = \frac{-3}{5}$, and α in quadrant III

d) $\tan(\alpha) = \frac{4}{3}$, and α in quadrant III

Verify the identity: $\tan^2(x)\cos(x) - \sec(x) = -\cos(x)$

If $\theta = \text{Arc}\cos\left(\frac{\sqrt{3}}{2}\right)$, what is the measure of angle θ?

If $\sin A = \frac{4}{5}$, $\tan B = \frac{5}{12}$, and angles A and B are in Quadrant I, what is the value of $\sin(A+B)$?

1) $\frac{63}{65}$
2) $-\frac{63}{65}$
3) $\frac{33}{65}$
4) $-\frac{33}{65}$

The expression $\frac{2\cos\theta}{\sin 2\theta}$ is equivalent to

1) $\csc\theta$
2) $\sec\theta$
3) $\cot\theta$
4) $\sin\theta$

Using the formula for $\cos(x-y)$, find the exact value of $\cos 15°$ in radical form if $m\angle x = 45$ and $m\angle y = 30$.