Exam 4 Review

MAT 1275 Spring 2022

Part I. Exponential and Logarithmic Functions and Equations.

1. Suppose and investor deposits $30,000 into an account for which interest is compounded daily. Find the amount of money in the account after 6 years using an interest rate $r = 6\%$.

2. Suppose an investor deposits $21,000 into a savings account for 7 years at 5.75% interest. Find the total amount of money in the account if the interest is compounded monthly.

3. Solve for x and round the answer to the nearest tenth: $3^x = 38$

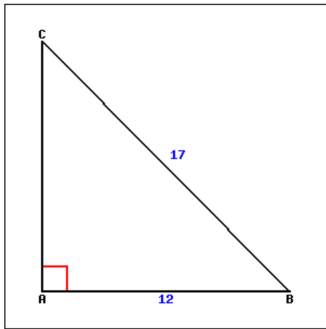4. Evaluate the logarithm **without** using a calculator: $\log_4(16\sqrt[3]{4})$

Part II. Trigonometry

1. For each of the following angles θ find i) the reference angle and ii) find $\sin(\theta)$, $\cos(\theta)$ and $\tan\theta$.

   (a) $\theta = 120\deg$
   (b) $\theta = 225\deg$ and
   (c) $\theta = \dfrac{9\pi}{4}$

2. The beach in Brooklyn Bridge part is 1716 feet from the nearest tower of the Brooklyn Bridge. Standing on the beach, the angle of elevation to the top of the tower is $9.14\deg$. Find the height of the tower above the water, to the nearest foot.

3. From the top of a 100 meter cliff, the angle of depression to a distant lighthouse is $25\deg$. How far is the lighthouse from the base of the cliff? Round your answer to the nearest tenth of a meter.

4. For each of the following functions, find the amplitude, the period, and sketch a graph (showing at least one complete cycle).

   (a) $f(x) = 3\sin(2x)$

(b) $g(x) = -\dfrac{1}{2}\sin(\dfrac{2}{3}x)$

(c) $h(x) = 2\cos(4x)$

5. For the triangle shown, find angles B and C along with the side AC.

6. For the triangle shown, find angles B and C along with the side AB.

7. Verify the following identities:

(a) $\tan(\theta)(\cot(\theta) + \tan(\theta)) = \sec^2(\theta)$

(b) $\dfrac{\sin(\theta)\cos(\theta) + \cos(\theta)}{\sin(\theta) + \sin^2(\theta)} = \cot(\theta)$