Math 30, Homework 8 on sections 4.2, 4.3, 4.4, 4.5

Write all your working out and answers on your own notepaper - no need to write the questions. Please use lots of space.

It is very important that you show clearly any work you had to do to get your answers. Just writing the answer down with no work shown is usually not enough. Do all 15 questions - they are worth 2 points each. Hand in your solutions next week only.

For these first 10 questions, *check that your answers match the solutions on page 3*. If you don't get the same answers then look at your notes or the book or ask me. Only do the last five questions when you are sure you understand the first ten.

(1) Give the exact values of:

    (a) $\sin(\pi/2)$

    (b) $\cos(\pi/4)$

    (c) $\tan \pi$

(2) If $\sin \theta = 3/4$ find:

    (a) $\csc \theta$

    (b) $\sin(-\theta)$

    (c) $\sin(\theta + 2\pi)$

(3) Let θ be an angle in a right angled triangle with hypotenuse of length 7 and adjacent side of length 3. Find exactly:

    (a) $\cos \theta$

    (b) $\sin \theta$

    (c) $\tan \theta$

    (d) $\sec \theta$

(4) Find exactly:

    (a) $\cos(\pi/6)$

    (b) $\sin(\pi/3)$

    (c) $\cot(\pi/6)$

(5) Let β be an angle in standard position. If $\tan \beta < 0$ and $\cos \beta < 0$, which quadrant is the terminal side in?

(6) Find the reference angles for:

    (a) $100°$

    (b) $200°$

    (c) $7\pi/4$

(7) By using the reference angle and adjusting the sign, find the exact value of $\sin(7\pi/4)$

(8) By using the reference angle and adjusting the sign, find the exact value of $\tan(-5\pi/6)$

(9) Determine the amplitude, period and phase shift of $y = 3\sin(2x - \pi/2)$. Then graph one period of the function by first plotting the 5 key points.

(10) Determine the amplitude, period and phase shift of $y = -\dfrac{1}{2}\cos(3x)$. Then graph one period of the function by first plotting the 5 key points.

Five more questions. Show clearly all your working out and reasoning.

(11) If $\cos\theta = 2/5$ find:

    (a) $\sec\theta$

    (b) $\cos(-\theta)$

    (c) $\cos(\theta - 20\pi)$

(12) Find exactly:

    (a) $\tan(\pi/6)$

    (b) $\sin(\pi/4)$

    (c) $\sec(\pi/3)$

(13) Let α be an angle in standard position. If $\sin\alpha < 0$ and $\cos\alpha > 0$, which quadrant is the terminal side in?

(14) By using the reference angle and adjusting the sign, find the exact value of $\sin(8\pi/3)$

(15) Determine the amplitude, period and phase shift of $y = -2\sin(x - \pi/2)$. Then graph one period of the function by first plotting the 5 key points.

Answers to questions (1)-(10):

(1) **(a)** $\sin(\pi/2) = 1$

    (b) $\cos(\pi/4) = \sqrt{2}/2$

    (c) $\tan \pi = 0$

(2) **(a)** $\csc \theta = 4/3$

    (b) $\sin(-\theta) = -3/4$

    (c) $\sin(\theta + 2\pi) = 3/4$

(3) **(a)** $\cos \theta = 3/7$

    (b) $\sin \theta = 2\sqrt{10}/7$

    (c) $\tan \theta = 2\sqrt{10}/3$

    (d) $\sec \theta = 7/3$

(4) **(a)** $\cos(\pi/6) = \sqrt{3}/2$

    (b) $\sin(\pi/3) = \sqrt{3}/2$

    (c) $\cot(\pi/6) = \sqrt{3}$

(5) The terminal side is in Quadrant II.

(6) **(a)** $100°$ has reference angle $80°$

    (b) $200°$ has reference angle $20°$

    (c) $7\pi/4$ has reference angle $\pi/4$

(7) The exact value of $\sin(7\pi/4)$ is $-\sqrt{2}/2$

(8) The exact value of $\tan(-5\pi/6)$ is $\sqrt{3}/3$

(9) The amplitude is 3, the period is π and the phase shift is $\pi/4$. The 5 key points are $(\pi/4, 0)$, $(2\pi/4, 3)$, $(3\pi/4, 0)$, $(4\pi/4, -3)$ and $(5\pi/4, 0)$. Draw a smooth sine wave through these 5 points. (No corners!)

(10) The amplitude is $1/2$, the period is $2\pi/3$ and the phase shift is 0. The 5 key points are $(0, -1/2)$, $(\pi/6, 0)$, $(2\pi/6, 1/2)$, $(3\pi/6, 0)$ and $(4\pi/6, -1/2)$. Draw a smooth cosine wave through these 5 points.