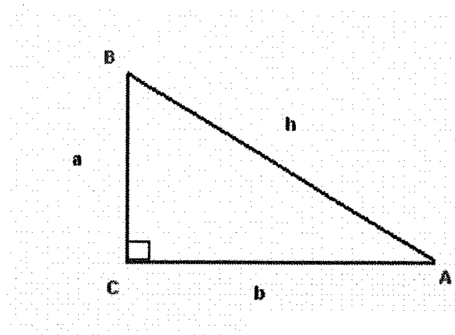
Note: The actual exam will be shorter.

MAC 1114 EXAM 3 SPRING-2016

$\boxed{1}$ (15 points) Determine the amplitude, period, and phase shift of $y = 4\sin(2x - \frac{2\pi}{3})$. Then graph the function.

$\boxed{2}$ (10 points) Use the right triangle shown in the picture to find b, c, and B. We know that $b = 5$, $B = 60°$. You need to use trigonometric functions for this question, other methods will be disregarded.



$\boxed{3}$ (20 points)

(a) (3 points) Find the exact value of $\cos^{-1}(-\frac{\sqrt{2}}{2})$. Explain your answer.

(b) (3 points) Find the exact value of $\sin(\sin^{-1}(-2\pi))$.

(c) (4 points) Find the exact value of $\sin^{-1}\left(\sin(\frac{5\pi}{6})\right)$. Explain your answer.

(d) (5 points) Find the exact value of $\tan\left(\sin^{-1}(-\frac{4}{5})\right)$.

(e) (5 points) Find the exact value of $\sin(75°)$

$\boxed{4}$ (15 points)

(a) (5 points) Verify the identity

$$\cos\theta \cdot \csc\theta \cdot \tan\theta = 1$$

(b) (10 points) Verify the identity

$$\frac{\sec(2\theta) - \cos(2\theta)}{\sin^2(2\theta)} = \sec(2\theta)$$

$\boxed{5}$ (15 points) Given that $\sin(\alpha) = \frac{4}{5}$, α lies in quadrant I, and $\sin(\beta) = \frac{4}{5}$, β lies in quadrant II. Find the exact value of $\sin(\alpha - \beta)$.

$\boxed{6}$ (10 points) Verify the identity

$$(\sin\theta - \cos\theta)^2 = 1 - \sin 2\theta$$

MAC 1114 EXAM 3

7 (20 points)

(a) (10 points) Find the value of $2 + \sin^2(75°) + \sin^2(15°)$. Explain your answer.

(b) (10 points) Use the reference angle to find the exact value of $\sin(-135°)$. Explain your answer.

8 (Bonus 5 points) Find the exact value of

$$\cos^2(22.5°) - \sin^2(22.5°)$$

MAC 1114

EXAM THREE

$\boxed{9}$ (25 points)

(a) (10 points) Solve the equation over the interval $[0, 2\pi)$

$$\cos(2x) = \frac{\sqrt{2}}{2}$$

(b) (15 points) Solve the following equation on the interval $[0, 2\pi)$

$$\sin x \cdot \cos x = -\frac{\sqrt{3}}{4}$$