

Part I - Multiple Choice Questions

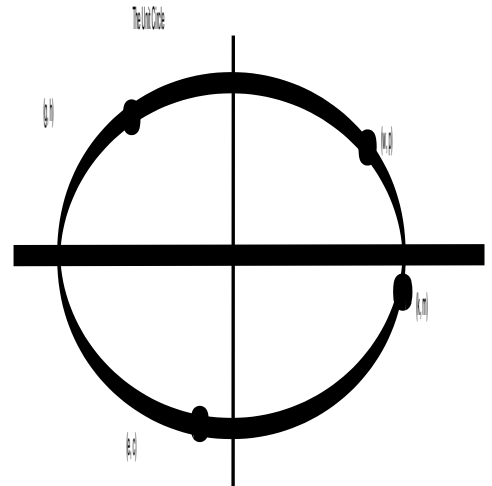
Complete each of the following with the best fitting answer and place your answer in the spaces provided at the beginning of Part II. (20 marks)

1. Which angle is co-terminal with -137° ?

- A) 43° B) 137° C) 583° D) 857°

2. Which one of the following coordinates best corresponds to the $\sin(-240^\circ)$?

- A) c
B) m
C) p
D) h



3. What is the value of θ if $\cos(\theta) = -0.987$ and $\theta > 180^\circ$?

- A) 178° B) 192° C) 348° D) 372°

4. What is the location after the following rotation?

$$R_{-60^\circ} 1,0$$

- A) $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ B) $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ C) $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ D) $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

5. What is the exact value for; $\sin(-120^\circ) + \cos(-540^\circ)$?

- A) $\frac{-\sqrt{3}-2}{2}$ B) $-\frac{3}{2}$ C) $\frac{-\sqrt{3}+2}{2}$ D) $\frac{1}{2}$

6. What is the simplified result when we rationalize the denominator for $-\frac{10\sqrt{3}}{\sqrt{5}}$?

- A) $-2\sqrt{3}$ B) $-5\sqrt{3}$ C) $-2\sqrt{15}$ D) $-5\sqrt{15}$

7. What are the values of x which satisfy the equation $-5\sin x - 2 = 0$ if $0^\circ \leq x < 360^\circ$?

A) 23.6° and 156.4°

B) 23.6° and 336.4°

C) 156.4° and 203.6°

D) 203.6° and 336.4°

8. What are the solutions to the equation; $-2\sin x + 1 = 0$?

A) $x = \begin{cases} 30^\circ + 360n \\ 330^\circ + 360n \end{cases} \quad n \in I$

B) $x = \begin{cases} 210^\circ + 360n \\ 330^\circ + 360n \end{cases} \quad n \in I$

C) $x = \begin{cases} 150^\circ + 360n \\ 210^\circ + 360n \end{cases} \quad n \in I$

D) $x = \begin{cases} 30^\circ + 360n \\ 150^\circ + 360n \end{cases} \quad n \in I$

9. In which quadrant is "sin" value positive and "cos" value negative?

A) 1st

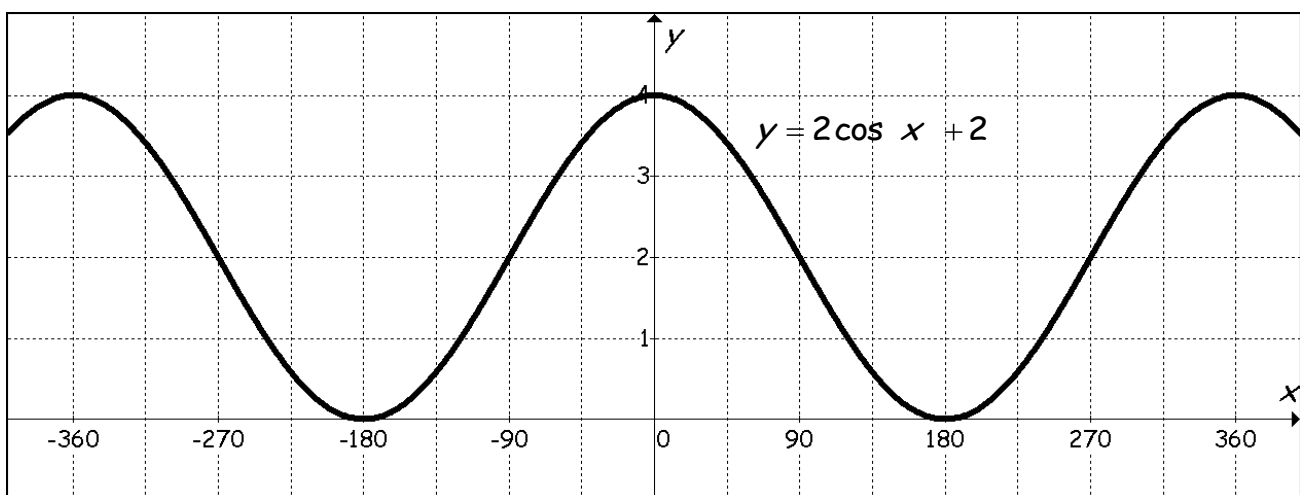
B) 2nd

C) 3rd

D) 4th

10. According to the graph below, what are the solutions to the equation;

$$2\cos x + 2 = 2$$



A) $-360^\circ, 0^\circ$ and 360°

B) -180° and 180°

C) $-270^\circ, -90^\circ, 90^\circ$ and 270°

D) $-225^\circ, -135^\circ, 135^\circ$ and 225°

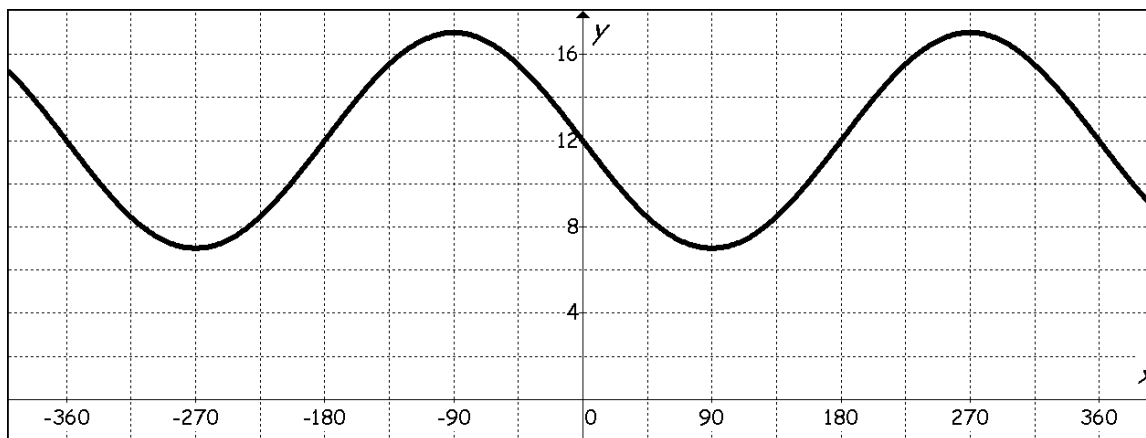
Part II. Long Answer Questions

1. Determine the exact value of the following. Be sure to show all significant workings including diagrams of the unit circle. Write your answer in simplest form.

A) $\frac{2\cos(120^\circ)}{\sin(270^\circ)} + [\sin(-60^\circ)]^2$ (4 marks)

B) $\cos(-135^\circ)\sin(60^\circ) + \sin(-450^\circ)$ (4 marks)

2. Consider the graph of $y = -5\sin(x) + 12$.



- A) For the extent of the graph, estimate and label the solutions to the equation; $10 = -5\sin(x) + 12$. (2 marks)
- B) Explain why the equation; $2 = -5\sin(x) + 12$ has no solutions. (2 mark)
3. Solve the following trigonometric equations for all possible values of x .
- A) $-2\sin(x) + \sqrt{3} = 0$ (4 marks)
- B) $7.2\cos(x) + 4.3 = 7.9$ (4 marks)