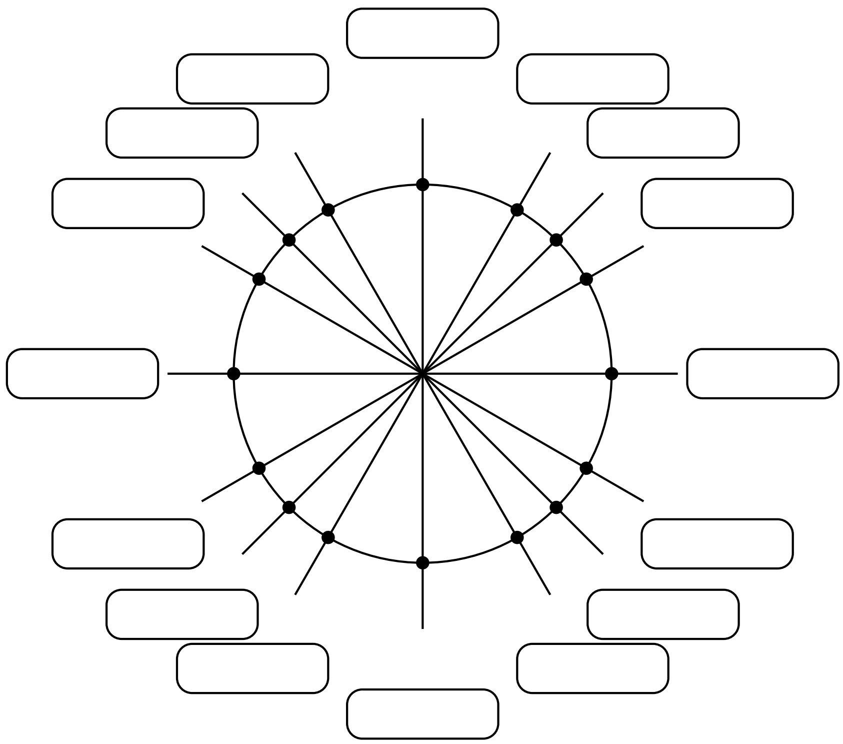
Exam 2 - Chapter 8 (8.1-8.3)

Formulas (given on test)

Formulas:

Arc length $= r\theta$ Sector area $= \frac{1}{2}r^2\theta$

Angular speed $= \dfrac{\text{angle}}{\text{time}}$ Linear speed $= \dfrac{\text{arc length}}{\text{time}}$



8.1: Graphs of sine and cosine

- All sine and cosine curves are **periodic**
- The **parent graphs** $y = \sin(x)$ and $y = \cos(x)$ have a period of 2π
- Graph transformations of the form $y = A \cdot \sin(Bx - C) + D$ and $y = A \cdot \cos(Bx - C) + D$:
  - The **amplitude** is $|A|$. Amplitude is always positive. If A is negative, the parent graph is flipped or reflected vertically
  - The **period** is $\dfrac{2\pi}{B}$. *(B will always be positive on the exam.)*
  - The **phase shift** is $\dfrac{C}{B}$. If C is positive, the shift is to the *left*. If C is negative, the shift is to the *right*.
  - D is the vertical shift. The **midline** of the graphs is $y = D$.
- Graph a sine or cosine curve given an equation, or find an equation given a graph.
- List the amplitude, period, phase shift and vertical shift of a function given either a graph or an equation.
- **Word problems** involving sine or cosine curves.

8.2: Graphs of other trig functions

- The parent functions $y = \tan(x)$ and $y = \cot(x)$ have a period of π.
- The parent functions $y = \sec(x)$ and $y = \csc(x)$ have a period of 2π.
- Graph the **parent functions** $y = \tan(x)$, $y = \cot(x)$, $y = \csc(x)$, and $y = \sec(x)$
- Graph transformations of the form $y = A \cdot \tan(Bx - C) + D$, $y = A \cdot \cot(Bx - C) + D$, $y = A \cdot \sec(Bx - C) + D$ and $y = A \cdot \csc(Bx - C) + D$:
  - All of these graphs have **asymptotes**
  - A gives the vertical stretch or compression. *(A will always be positive on the exam for these graphs. Only sine and cosine graphs have an amplitude.)*
  - The **period** for tangent and cotangent graphs is $\dfrac{\pi}{B}$. The **period** for secant and cosecant graphs is $\dfrac{2\pi}{B}$. *(B will always be positive on the exam.)*

  - The **phase shift** is $\frac{C}{B}$. If C is positive, the shift is to the *left*. If C is negative, the shift is to the *right*.
  - D is the vertical shift.

- Graph these trig functions given an equation, or find an equation given a graph.

8.3: Inverse trig functions

- For all trig functions, we must restrict the domain of the original function so it is one-to-one so we can define the inverse function.
- Know the domain and range of $y = \sin^{-1}(x),\ y = \cos^{-1}(x)$ and $y = \tan^{-1}(x)$.
- Graph $y = \tan^{-1}(x)$
- **Compose** trig functions and inverse trig functions using special angles or by drawing triangles
- IMPORTANT: Be careful composing $\sin^{-1}(\sin(x)),\ \cos^{-1}(\cos(x))$ and $\tan^{-1}(\tan(x))$
- Inverse trig functions can help us find missing sides and angles in right triangles.

Suggested practice problems:

- Quiz 3
- Ch. 8 Review p. 690-691 #1-5, 8-10, 13-17, 19, 21-24, 27-37
- Ch. 8 Practice Test (from book) p. 692-693 #1-5, 7, 8, 10-12, 14-20, 23, 29, 30, 36-40, 46-49