Graphing Sine and Cosine

Goals for today:

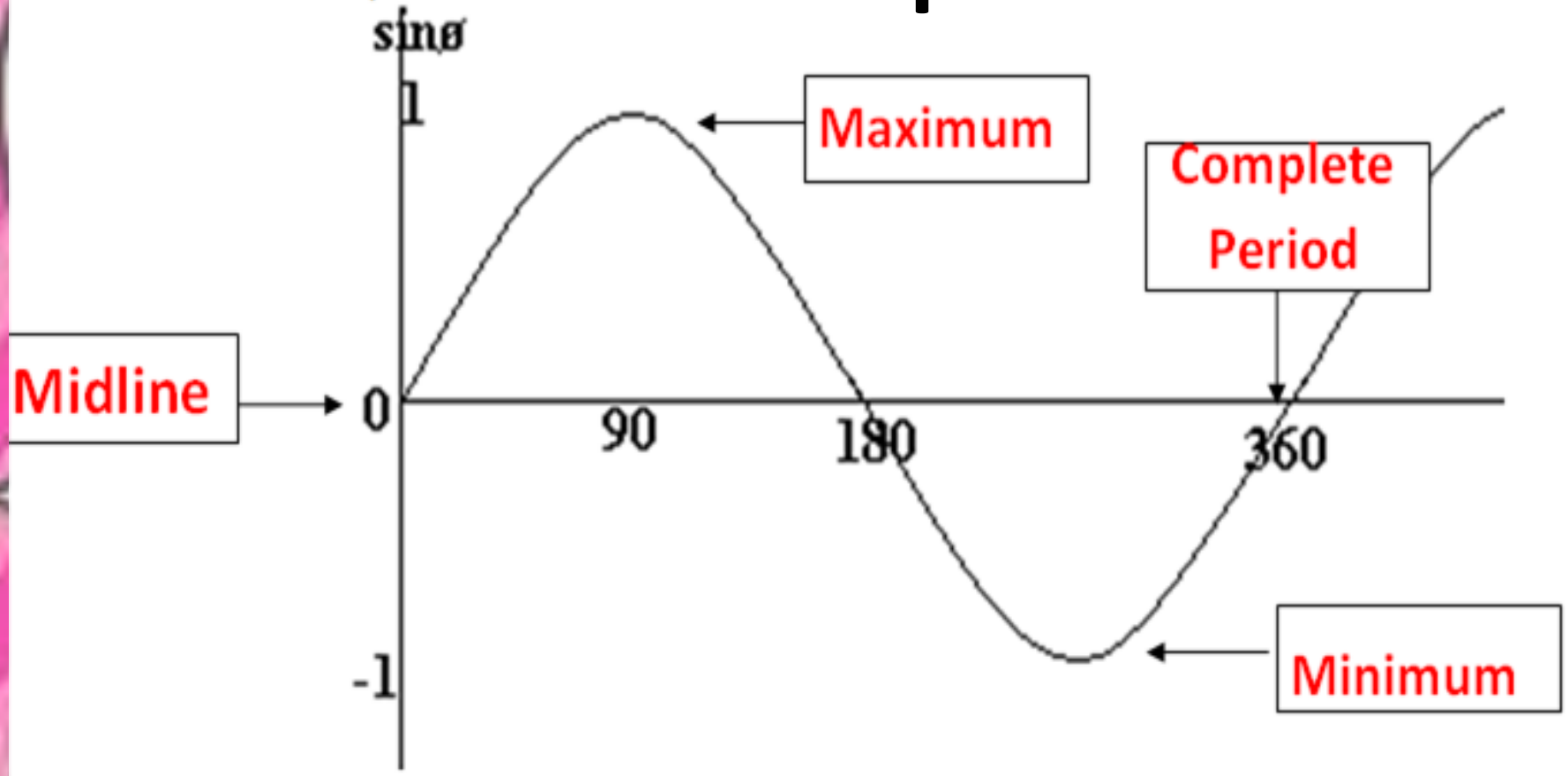
Graph sine, cosine and tangent graphs by hand

Identify areas of increase/decrease/positive/negative on graphs of trig functions

Accurately identify amplitude and midline of a trigonometric graph or function

Sine Graph

I. Sine Graph



a. Sine is increasing: (0,90) U (270,360)

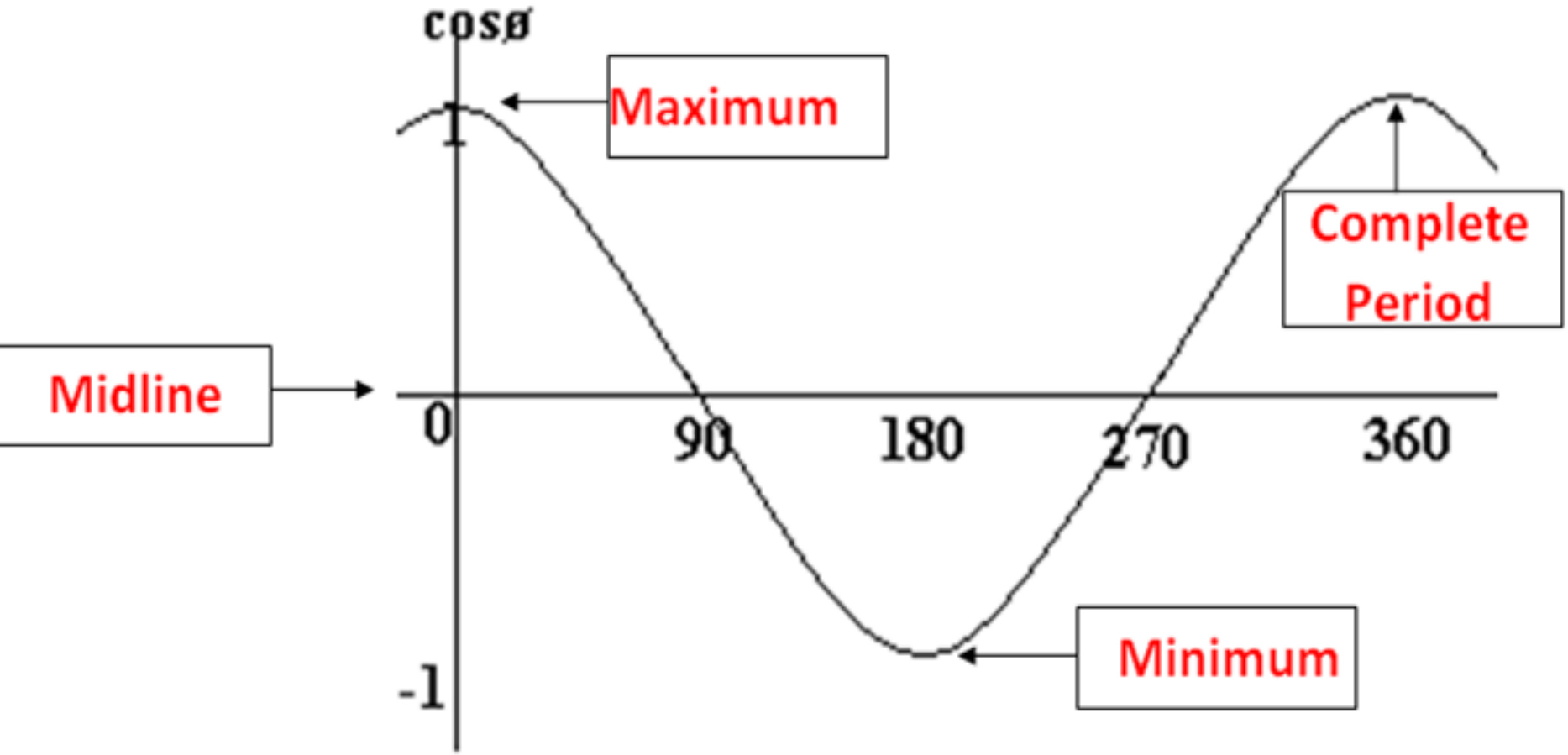
b. Sine is decreasing: (90,270)

c. Sine is positive: (0,180)

d. Sine is negative: (180,360)

Cosine Graph

II. Cosine Graph



a. Cosine is increasing: (180,360)

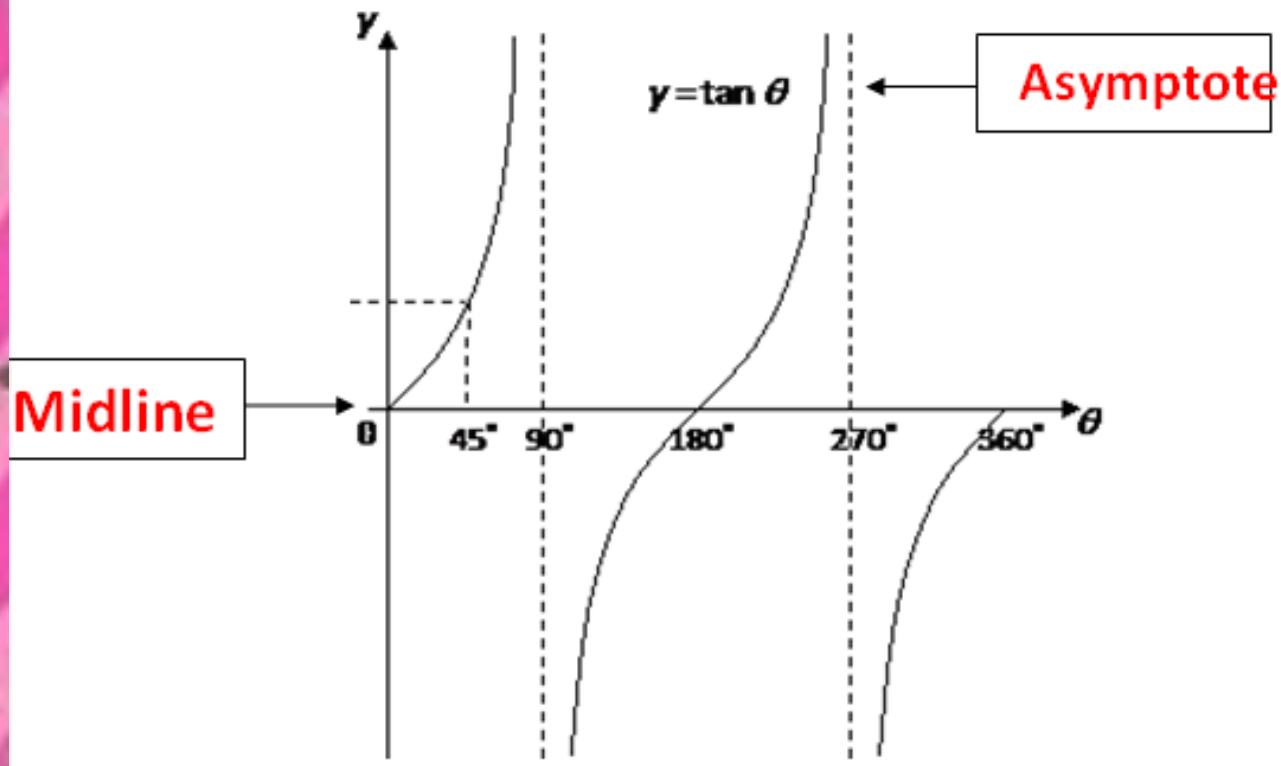
b. Cosine is decreasing: (0,180)

c. Cosine is positive: (0,90) U (270,360)

d. Cosine is negative: (90,270)

Tangent Graph

IV. Tangent Graph



a. Tangent is increasing: (0,90) U (90, 270) U (270,360)

b. Tangent is decreasing: never

c. Tangent is positive: (0,90) U (180, 270)

d. Tangent is negative: (90,180)U(270,360)

Amplitude

a. A graph in the form $y = a\sin x$ or $y = a\cos x$ has an amplitude of $|a|$.

b. The amplitude of a standard sine or cosine graph is 1.

c. The amplitude of a sine or cosine graph can be found using the following formula:

$$\text{Amplitude} = |a|$$

Find the amplitude for each of the following:

1. $y = 3\sin x$

a=3 abs(3) = 3 amplitude = 3

2. $y = -4\cos 5x$

a=-4 abs(-4) = 4 amplitude = 4

3. $y = (1/3)\sin x + 5$

a=1/3 abs(1/3) = 1/3 amp = 1/3

Midline

a. The midline is the line that "cuts the graph in half."
b. The midline is halfway between the max and min
c. The midline can be found using the following formula:

$$\text{Midline is at } y = \frac{\text{max}+\text{min}}{2}$$

d. When there is no vertical shift, the midline is always $y = 0$.