PLOTTING THESE PAIRS OF VALUES AND JOINING THEM WITH A SMOOTH CURVE, THE GRAPH OF $y = \sin x$ TAKES THE FOLLOWING FORM: — p71

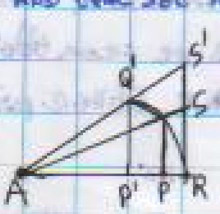
FIGURE 17

IF WE WERE TO GRAPH $y = \sin 2x$, THE LOOPS WOULD BE HALF AS LONG, I.E., THERE WOULD BE TWICE AS MANY OF THEM. AGAIN, THE GRAPH OF $y = 2\sin x$ WOULD DIFFER FROM THE GRAPH OF $y = \sin x$ IN THAT IT WOULD VARY FROM A MAXIMUM HEIGHT OF +2 TO A MINIMUM OF −2, THAT IS, THE HIGHEST AND LOWEST POINTS OF THE CURVE WOULD BE TWICE AS FAR APART AS THOSE ON THE GRAPH OF $y = \sin x$. IN GENERAL, IN THE GRAPH OF $y = a\sin bx$, a IS CALLED THE AMPLITUDE OF THE CURVE, AND b THE FREQUENCY. THIS TERMINOLOGY SUGGESTS THAT THESE CURVES ARE ASSOCIATED WITH THE STUDY OF WAVE PHENOMENA — LIGHT, SOUND AND ELECTRICITY. IN FACT, THE CURVES TRACED BY THE NEEDLE ON A SPEECH-RECORDING MACHINE ARE SINE CURVES.

WHILE WE HAVE NOT, BY ANY MEANS, COVERED THE SOLUTION OF ALL TYPES OF TRIANGLES NOR ALL THE THEORY OF TRIGONOMETRY, WE BELIEVE THAT THIS BRIEF SURVEY IS SUFFICIENT TO INDICATE THAT TRIGONOMETRY HAS COME A LONG WAY FROM THE PSEUDOSCIENCE OF ASTROLOGY AND THAT IT OCCUPIES AN HONORABLE PLACE AMONG THE BRANCHES OF MATHEMATICS.

PROBLEMS — TRIGONOMETRY — 23/01/2019

1. THE RECIPROCAL FUNCTIONS MENTIONED IN THE ARTICLE ARE RELATED TO THE FUNCTIONS DISCUSSED AS FOLLOWS: $\cot A = 1/\tan A$; $\sec A = 1/\cos A$; $\csc = A/\sin A$. IN FIGURE 7, SHOW THAT THE LINE SEGMENT $\overline{AS}$ REPRESENTS $\sec A$ AND THAT $\sec^2 A = 1 + \tan^2 A$. AR = 1



$\cos A = \dfrac{AR}{AS}$ $\quad \sec A = \dfrac{1}{\cos A}$ ~~= AS~~

$\cos A = \dfrac{1}{AS}$ $\quad \sec A = \dfrac{1}{\frac{1}{AS}} = AS$