

Trigonometric Equations

These notes are intended as a companion to section 7.1 and 7.2 (p. 572 – 576 and 584 to 591) in your workbook. You should also read the section for more complete explanations and additional examples.

Additional Examples

In this lesson, we are going to complete some of the examples from the workbook, as well as some additional examples.

Example (not in workbook)

Solve $\cos 2\theta = -\frac{\sqrt{3}}{2}$ over the domain $0 \leq x \leq 2\pi$.

Example 2 (7.1 sidebar p. 575)

a) Solve $\sin 3x = 0$ over the domain $0 \leq x \leq 2\pi$. Give the roots as exact values.

b) State the general solution of the equation.

Example 3 (7.1 sidebar p. 576)

Solve $\cos x = x^2$ over the set of real numbers. Give the roots to the nearest hundredth.

Method 1

Enter each side of the equation into your graphing calculator as a separate function. The solution is the x -coordinates of the points of intersection.

Method 2

The equation is rearranged so that 0 is on one side. The expression on the other side is entered into your graphing calculator. The solution is the zeros of this function.

Example 4 (7.2 sidebar p. 590)

a) Use algebra to solve the equation $\cos x = 1 - 3\cos^2 x$ over the domain $-\pi \leq x \leq \pi$. Give your answer to the nearest hundredth.

b) Determine the general solution.

Homework: Section 7.1: #5 – 7, 9 – 10 in the exercises (p. 577 – 581). Answers on p. 582.
Section 7.2: #4 – 9, 11 – 14 in the exercises (p. 592 – 597). Answers on p. 600.