Answers: Rearranging equations involving trigonometry and logarithms

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This is an answer set relating to the questions based on Guide, Introduction to rearranging equations involving trigonometry and logarithms.

*These are the answers to* [*Questions: Introduction to rearranging equations using trigonometry and logarithms*](../questions/qs-rearrangingtrigandlogs.qmd)

**Please attempt the questions before reading these answers!**

## Q1

Solve the trigonometric equations in radians.

1.1 For , x is equal to or 1.57.

1.2 For , x is equal to or 0.0234.

1.3 For , x is equal to 0.323.

1.4 For , x is equal to -1 or -3. To do this, you use that and so you need to solve the quadratic equation .

## Q2

Rewrite and in terms of , , and

Then, multiply both sides of the equation by

.

## Q3

Rewriting gives . Setting this equal to 10 and solving gives . If you have a slightly different answer, this may be due to rounding at different points in the process.

## Q4

4.1 , , .

4.2 , , .

4.3 , , .

4.4 , , .

4.5 , , .

## Q5

5.1 The solution to is , or approximately 3.97.

5.2 The solution to is .

5.3 If , then .

## Q6

Firstly, substitute y into the first equation. This gives . Via example 7, you can see that this means . Rearranging this gives or approximately 2.33. Plugging this into the second equation gives or approximately 1.22.

## Q7

7.1 If , then multiply everything by and define y such that . This makes and solving this gives . Then, or .

7.2 Using the same method detailed above and or .

## Q8

8.1 If , then .

8.2 If , then .

8.3 If , then . Substituting gives , thus . This means that .