Title: **Trigonometry** Worksheet: 23

Course: Electrical Applications Unit: Electrical Theory CLO: 3

Name ANSWER KEY Grade 30pts. Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall determine the third side of a triangle given two other sides.
2. Student shall apply trigonometric functions to produce appropriate quantities of a triangle.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Worksheet. Grading shall be based on an answer key.

**Theory**

Trigonometry is a branch of mathematics that studies relationships involving lengths and angles of triangles. An understanding of trigonometry is needed in the electrical field for both solving alternating current (AC) circuits and conduit bending. First, we will look at determining an unknown side of a right triangle given the length of the two other sides.



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Next, we will look at determining an unknown side of a right triangle given an angle and a side. It is also able to determine the angle if given two sides. To do this, we will use three trigonometric functions; sine (sin), cosine (cos), tangent (tan).



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**Instructions**

Using the formulas from the previous page, determine the length of the unknown side given two other sides.

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| --- | --- | --- | --- |
|  | a | b | c |
| 1. | 3 | 4 | 5 |
| 2. | 5.6 | 2.1 | 5.981 |
| 3. | 96.825 | 25 | 100 |
| 4. | 212 | 507.5 | 550 |
| 5. | 59.321 | 65 | 88 |
| 6. | 123 | 439.098 | 456 |

**Instructions**

Using the formulas from the previous page, determine the length of the unknown side given one side and the angle.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | O | H | θ |
| 7. | 10.392 | 6 | 12 | 30˚ |
| 8. | 1 | 1 | 1.414 | 45˚ |
| 9. | 2.5 | 1.036 | 2.7 | 22.5˚ |
| 10. | 19.625 | 6 | 20.522 | 17˚ |
| 11. | 3.438 | 8.1 | 8.8 | 67˚ |
| 12. | 3.2 | N/A | N/A | 90˚ |

**Instructions**

Using the formulas from the previous page, determine the angle of theta and length of the unknown side given the length of two sides.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | O | H | θ |
| 13. | 5 | 7.483 | 9 | 33.749˚ |
| 14. | 2 | 4 | 4.472 | 63.435˚ |
| 15. | 4.2 | 12.619 | 13.3 | 71.592˚ |
| 16. | 6.06 | 3.7 | 7.1 | 31.407˚ |
| 17. | 5.6 | 8.9 | 10.515 | 57.821˚ |
| 18. | 5.48 | 2.9 | 6.2 | 27.888˚ |