**DETERMINING ANGLES IN RIGHT TRIANGLES**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| RECALL the three primary trigonometry ratios.**KEY WORDS**Opposite/HypotenuseAdjacent/HypotenuseOpposite/AdjacentInverseSin-1Cos-1Tan-1acutemeasuretwo

|  |  |  |
| --- | --- | --- |
|  |  |  |

For every trigonometry ratio there is an \_\_\_\_\_\_\_\_\_\_ ratio. It is used to calculate **ANGLES**. Inverse ratios are usually found on a scientific calculator by using the 2ndF, INV, or SHIFT key

|  |  |  |
| --- | --- | --- |
| The inverse for **sin** is: \_\_\_\_\_\_\_ | The inverse for **cos** is: \_\_\_\_\_\_\_\_ | The inverse for **tan** is: \_\_\_\_\_\_\_\_ |

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**CASE A) DETERMINING THE ANGLE WITH INVERSE RATIO**

**Solved Example**: Calculate the angles given. Round your answer to whole degree.

|  |
| --- |
|  sin *θ* = 0.667 \*swap *θ with 0.667* sin-1 0.667 = *θ* \*sin becomes sin-1 *θ = 4* |

**Example**: Calculate each of the angles given. Round your answer to whole degree.

|  |  |
| --- | --- |
| a) cos *θ* = 0.667 | b) tan *θ* = 0.667 |
|  |  |

**CASE B) DETERMINING THE ANGLE FROM THE TRIANGLE**

To find the measure of a(n) \_\_\_\_\_\_\_\_ angle in a right-angle triangle, it is necessary to have the \_\_\_\_\_\_\_\_\_\_\_\_\_ of any \_\_\_\_\_\_\_\_\_ sides of the triangle.

**3 Steps to Solving ANGLES**

**Step 1**: Label the sides of your triangle relative to the angle you want to find

**Step 2**: Determine which trig ratio to use (sin, cos, tan)

**Step 3**: Set up the equation with the unknown and solve using the ***inverse*** trig ratio (sin-1, cos-1, or tan-1).

|  |
| --- |
| **Solved Example:** Determine the angle shown to the nearest degree.**Step 1:** **Step 2: with sides O and A we calculate tan ratio****Step 3:** $tan θ=\frac{6}{8}$ \*swap 6/8 with $θ$$$ tan^{-1}\frac{6}{8}=θ$$ ∴ Angle $θ$ is approximately 37o. |

**PRACTICE**

**Example**: Find each of the angles shown, rounded to one decimal place.

|  |  |  |
| --- | --- | --- |
| a) Find  | b) Find  | c) Find  |

1. Evaluate each of the following to the nearest degree.

|  |  |  |
| --- | --- | --- |
| 1.
 | 1.
 | 1.
 |
| 1.
 | 1.
 | 1.
 |

1. Find each of the angles shown. Round to one decimal.

|  |  |
| --- | --- |
| 1.
 | 1.
 |
| 1.
 | 1.
 |

1. Find the length of side x to the nearest tenth of a metre and of angle θ to the nearest degree.



1. Based on the following diagram use the values given to find the missing angles indicated.

a) *a* = 55 m, *b* = 137 m 🡪 find ∠*A*, ∠*B*

*Diagram is NOT drawn to scale*

b) *a* = 235 cm, *c* = 268 cm 🡪 find ∠*A*, ∠*B*

c) *b* = 21 mm, *c* = 40 mm 🡪 find ∠*A*, ∠*B*

d) *a* = 30 cm, *b* = 285 cm 🡪 find ∠*A*, ∠*B*