|  |  |
| --- | --- |
| **Notes – Special Right Triangles & Trigonometry** | **Name:** |
| **Standard:**  | **Hour:**  |

**Objective:** I can find the exact value of trig ratios for 30o, 45o, 60o using special right triangles.

**Warm-up.**

|  |  |  |
| --- | --- | --- |
| 1. $\frac{2}{\sqrt{3}}$
 | 1. $\frac{6\sqrt{3}}{2}$
 | 1. $\frac{3}{3\sqrt{2}}$
 |

Find the missing side lengths of each of the special right triangles.



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

18 | 1.

330o | 1.

860o |

**Explore**

Find the exact value each of the indicated trig ratios. Simplify your answers leaving no radicals in the denominator.

|  |
| --- |
| 1.

18ABC960o$\sin(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\sin(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$$$9\sqrt{3}$$$\cos(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\cos(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$$\tan(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\tan(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$ |
| 1.

JKF$$4\sqrt{3}$$30o$\sin(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\sin(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$$\cos(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\cos(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$$\tan(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\tan(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$ |
| 1.

XYZ160o$\sin(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\sin(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$$\cos(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\cos(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$$\tan(30°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\tan(60°)=\\_\\_\\_\\_\\_\\_\\_\\_$ |
| 1.

45o$$3$$$$3$$$$3\sqrt{2}$$ABC$\sin(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\cos(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\tan(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$  |
| 1.

6YXZ$\sin(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\cos(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\tan(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$  |
| 1.

45o$$\sqrt{2}$$DEF$\sin(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\cos(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$ $\tan(45°)=\\_\\_\\_\\_\\_\\_\\_\\_$  |

**Summary – So regardless of the size of the special right triangle, the trig ratios all reduce down to the same value!**

|  |  |  |  |
| --- | --- | --- | --- |
|  | 30o | 45o | 60o |
|  $sin$ |  |  |  |
| $cos$  |  |  |  |
| $tan$  |   |  |  |

**Homework** – Special Right Triangles & TrigName: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Fill in the side lengths of each of the special right triangles. Assume the shortest side to have a length of 1.

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

30o | 1.
 |

Find the indicated values using the triangle provided. Simplify your answers.

X

Y

Z

1

60o

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

$DF=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$45o$$5\sqrt{2}$$DEF$$FE=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$tan\left(D\right)$ = \_\_\_\_\_\_\_\_\_ | 1.

JKF$$4\sqrt{3}$$8$$m∠J=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$KF= \\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$sin\left(J\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$ |
| 1.

6YXZ6$$m∠X=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$sin\left(Y\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$cos\left(Y\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$ | 1.

$θ=\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$θ$$$$cos\left(θ\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$tan\left(θ\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$ |
| 1.

$$XY=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$cos\left(Y\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$tan\left(Y\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$ | 1.

$$7\sqrt{3}$$7ABC$$m∠B=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$sin\left(B\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$$$tan\left(A\right)=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$ |

**Rapid Practice**

Find the exact value for each trig ratio *without* using a calculator. A picture may be helpful, but no work is required.

|  |  |
| --- | --- |
| 1. $sin\left(30°\right)=$
 | 1. $cos\left(30°\right)=$
 |
| 1. $tan\left(60°\right)=$
 | 1. $sin\left(45°\right)=$
 |
| Find the value for angle $θ$, in degrees, *without* using a calculator. A picture may be helpful, but no work is required. |
| 1. $tan\left(θ\right)=1$
 | 1. $tan\left(θ\right)=\frac{\sqrt{3}}{3}$
 |
| 1. $cos\left(θ\right)=\frac{\sqrt{2}}{2}$
 | 1. $sin\left(θ\right)=\frac{\sqrt{3}}{2}$
 |