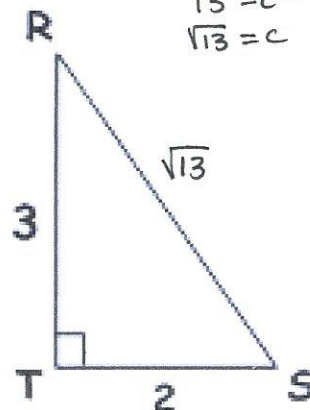


MGSE9-12.G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.  
MGSE9-12.G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.

Find the length of segment RS and use the diagram to find the trigonometric ratios.

1.  $\sin R = \frac{O}{H} = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$       4.  $\sin S = \frac{O}{H} = \frac{3}{\sqrt{13}} = \frac{3\sqrt{13}}{13}$   
2.  $\cos R = \frac{A}{H} = \frac{3\sqrt{13}}{13}$       5.  $\cos S = \frac{A}{H} = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$   
3.  $\tan R = \frac{O}{A} = \frac{2}{3}$       6.  $\tan S = \frac{O}{A} = \frac{3}{2}$

$$\begin{aligned} 3^2 + 2^2 &= c^2 \\ 9 + 4 &= c^2 \\ 13 &= c^2 \\ \sqrt{13} &= c \end{aligned}$$



7. What do you notice about the sin R and the cos S?

*They are the same.*

8. What do you notice about the cos R and the sin S?

*They are the same.*

9. What do you notice about the tan R and the tan S?

*They are reciprocals of each other.*

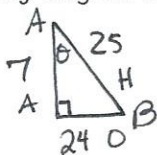
$\angle A$  and  $\angle B$  are complementary angles in a right triangle. The value of  $\sin A = \frac{24}{25} \cdot \frac{O}{H}$

10. What is the tan A?

$$\frac{O}{A} = \frac{24}{7}$$

11. What is the cos A?

$$\frac{A}{H} = \frac{7}{25}$$



$$\begin{aligned} a^2 + 24^2 &= 25^2 \\ a^2 + 576 &= 625 \\ a^2 &= 49 \\ a &= 7 \end{aligned}$$

$\angle M$  and  $\angle N$  are complementary angles in a right triangle. The value of  $\tan M = \frac{\sqrt{3}}{2} \cdot \frac{O}{A}$

12. What is the sin M?  $\frac{O}{H} = \frac{\sqrt{3}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{21}}{7}$

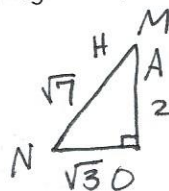
13. What is the cos M?  $\frac{A}{H} = \frac{2}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{2\sqrt{7}}{7}$

14. What is the sin N?  $\frac{2\sqrt{7}}{7}$

15. What is the cos N?  $\frac{\sqrt{21}}{7}$

16. What is the tan N?

reciprocal of  $\frac{\sqrt{3}}{2} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$



$$\begin{aligned} 2^2 + (\sqrt{3})^2 &= c^2 \\ 4 + 3 &= c^2 \\ 7 &= c^2 \\ \sqrt{7} &= c \end{aligned}$$

*same*

*same*