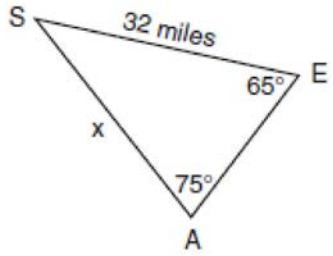
## A2.A.73: Law of Sines 5: Solve for an unknown side or angle, using the Law of Sines or the Law of Cosines

1 The accompanying diagram shows the approximate linear distances traveled by a sailboat during a race. The sailboat started at point $S$, traveled to points $E$ and $A$, respectively, and ended at point $S$.




Based on the measures shown in the diagram, which equation can be used to find $x$, the distance from point $A$ to point $S$?

1) $\frac{x}{\sin 65°} = \frac{\sin 75°}{32}$

2) $\frac{\sin 65°}{x} = \frac{\sin 75°}{32}$

3) $\frac{x}{65} = \frac{32}{75}$

4) $\frac{65}{x} = \frac{32}{75}$

2 In $\Delta PQR$, $p$ equals

1) $\frac{r \sin P}{\sin Q}$

2) $\frac{r \sin P}{\sin R}$

3) $\frac{r \sin R}{\sin P}$

4) $\frac{q \sin R}{\sin Q}$

3 In $\Delta ABC$, $m\angle A = 40$, $m\angle C = 65$, and $c = 12$. Which is a correct expression for $a$?

1) $\frac{12 \sin 40°}{\sin 75°}$

2) $\frac{12 \sin 65°}{\sin 40°}$

3) $\frac{12 \sin 65°}{\sin 75°}$

4) $\frac{12 \sin 40°}{\sin 65°}$

4 In $\Delta ABC$, $m\angle A = 75$, $m\angle B = 40$ and $b = 35$. What is the measure of side $c$?

1) $\frac{35 \sin 40°}{\sin 65°}$

2) $\frac{35 \sin 75°}{\sin 40°}$

3) $\frac{35 \sin 40°}{\sin 75°}$

4) $\frac{35 \sin 65°}{\sin 40°}$

5 In $\Delta ABC$, $a = 19$, $c = 10$, and $m\angle A = 111$. Which statement can be used to find the value of $m\angle C$?

1) $\sin C = \frac{10}{19}$

2) $\sin C = \frac{19 \sin 69°}{10}$

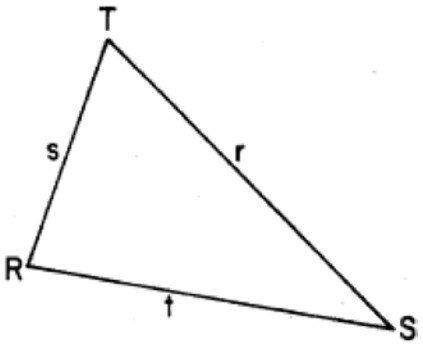
3) $\sin C = \frac{10 \sin 21°}{19}$

4) $\sin C = \frac{10 \sin 69°}{19}$

6 In $\Delta ABC$, $\sin A = \frac{1}{2}$ and $\sin B = \frac{1}{2}\sqrt{2}$. The value of $\frac{b}{a}$ is

1) $\frac{1}{2}$
2) $2$
3) $\sqrt{2}$
4) $\frac{1}{2}\sqrt{2}$

7 In triangle *RST*, what is the value of $r$ in terms of *R*, *T*, and *t*?




1) $r = \frac{tR}{T}$
2) $r = \frac{t \cdot \sin T}{\sin R}$
3) $r = \frac{\sin T}{t \cdot \sin R}$
4) $r = \frac{t \cdot \sin R}{\sin T}$

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## Answer Section

1 ANS: 2

The Law of Sines may also be written as $\frac{\sin A}{a} = \frac{\sin B}{b}$

REF: 010702b

2 ANS: 2 REF: 061322a2

3 ANS: 4 REF: 068530siii

4 ANS: 4 REF: 069430siii

5 ANS: 4

$\frac{19}{\sin 111} = \frac{10}{\sin C}$

$\sin C = \frac{10 \sin 111}{19}$. 111° is a Quadrant II angle with a reference angle of 69° in Quadrant I.

REF: 010407b

6 ANS: 3 REF: 019412siii

7 ANS: 4 REF: 088533siii