## 25-Soccer Abroad

${ }^{1}$ Micah and Steven are going to Romania with their soccer team. ${ }^{2}$ Romania is a country in Eastern Europe. ${ }^{3}$ Coach Kim gave the team the airline regulations for the size and weight of their luggage (shown below). ${ }^{4} \mathrm{He}$ warned, "You must follow these rules or you'll have to pay a lot of extra money. ${ }^{5}$ You can bring one carry-on suitcase to take inside the plane and one larger suitcase to check in. ${ }^{6}$ Don't bring anything else!"
${ }^{7}$ Steven said, "I don't get the 62 inches linear dimension rule."
${ }^{8}$ Coach explained, "Add length plus width plus height and make sure your sum is no more than 62 inches."
${ }^{9}$ Micah asked, "Instead of adding,
why don't they multiply the dimensions to get the volume and give people a list with volume restrictions?"
${ }^{10}$ Coach replied, "Micah, I have no idea-just follow the rules."
${ }^{11}$ Micah has a carry-on suitcase that measures $14^{\prime \prime} \times 9^{\prime \prime} \times 22^{\prime \prime}$ and weighs 21 lbs after being packed. ${ }^{12}$ The bigger suitcase that he wants to check in measures 7 " $\times 24^{\prime \prime} \times 32$ " and weighs 75 lbs after being packed.
${ }^{13}$ Steven went shopping for a suitcase whose linear measures had a sum closest to 62", but whose dimensions multiplied to the biggest volume possible. ${ }^{14} \mathrm{His}$ smaller carry-on suitcase measured $21^{\prime \prime} \times 13^{\prime \prime} \times 9^{\prime \prime}$. ${ }^{15} \mathrm{I} \dagger$ weighed 10 lbs when packed.

## Airline Baggage Regulations

1 carry-on suitcase 22" x 14" x 9" (must weigh less than 20 lbs )

Check-in items: 1 suitcase with linear dimensions, length + width + height no more than 62". (Items between 62" and 80" will be charged $\$ 80$ extra.)

Check-in items must weigh no more than 70 lbs . (Items that weigh more than 70 lbs up to 100 lbs will be charged $\$ 110$ extra.) Items weighing more than 100 lbs are not allowed.
$1 \mathrm{in} .=2.54 \mathrm{~cm}$
$1 \mathrm{lb}=.454 \mathrm{~kg}$
$1 \mathrm{~cm}=.39 \mathrm{in}$.
$1 \mathrm{~kg}=2.2 \mathrm{lb}$

## Questions

1. In the diagram Elijah drew, the length $(x)$ of the slide is the $\qquad$ of the right triangle.
a. hypotenuse side
c. opposite side
b. adjacent side
d. smallest side
2. In relationship to the $60^{\circ}$ angle, the length of the ladder shows
a. the adjacent side.
c. the opposite side.
b. the hypotenuse side.
d. none of these.
3. Which of the following formulas should Elijah use to find the length of the slide?
a. $\sin 60^{\circ}=\frac{4}{x}$
b. $\cos 60^{\circ}=\frac{x}{4}$
c. $\cos 60^{\circ}=\frac{4}{x}$
d. $\sin 60^{\circ}=\frac{x}{4}$
4. Which of the following is the design Latarsha wants to use for the slide?

c.

b.

d.


Give the number of the sentence that provides the best evidence for the answer. $\qquad$
5. Find the length of the slide using Latarsha's design. $\qquad$ Show your work.
6. If the ladder is 4 feet, the hypotenuse is $x$, and the angle between them is $60^{\circ}$, which of the following is the same as $\cos 60^{\circ}=\frac{4}{x}$ ?
a. $\sin 30^{\circ}=\frac{4}{x}$
b. $\sin 30^{\circ}=\frac{x}{4}$
c. $\operatorname{Tan} 60^{\circ}=\frac{4}{x}$
d. $\operatorname{Cos} 30^{\circ}=\frac{x}{4}$

## Questions

1. When comparing the formulas to the chart, Alex found that the Celsius scale
a. changes by $5 s$ while the Fahrenheit scale changes by $9 s$.
b. changes by $9 s$ and the Fahrenheit scale changes by $9 s$.
c. is 32 degrees less than the Fahrenheit scale.
d. is 32 degrees more than the Fahrenheit scale.
2. By using the chart, Alex found out that 35 degrees Celsius $\left(35^{\circ} \mathrm{C}\right)$ is the same as what temperature in Fahrenheit? $\qquad$
3. When Marcos called back, he told Alex that his sister had a fever of $40^{\circ} \mathrm{C}$. What temperature is that in Fahrenheit? $\qquad$
4. In the Fahrenheit scale, the freezing point of water is 32 degrees (or $0^{\circ}$ Celsius). The boiling point of water is $212^{\circ} \mathrm{F}$. What is the boiling point of water in Celsius?
$\qquad$ Show the formula you would use and then show your work.
5. Around the December holidays, Alex called Marcos and told him the temperature was $-20^{\circ} \mathrm{F}$. What temperature is that in Celsius? $\qquad$ Round the answer to the nearest tenth of a degree. Write the formula you would use and then show your work.
6. 

At $-40^{\circ}$ the temperature is the same on both scales. Use an algebra formula to show why this is so. Let $F=C$ and then solve for that variable.

