

Math Team
Meet 1 Events A and B Problems 1-2 2014-16 Practice

Event A

Problem #1 ("quickie"; 1 point)

Try to solve each problem within one minute.

1. Determine exactly how many Turkish lira 1 dollar will buy if a hotel room that costs \$54 may be obtained for 81 Turkish lira. [calculator allowed] (Based on MSHSML 2015-16 1A #1)

$$\begin{aligned}
 \$54 &= 81 \text{ lira} & 1 &= \frac{\$54}{81 \text{ lira}} = \frac{81 \text{ lira}}{\$54} \\
 \$1 &\cdot \frac{81 \text{ lira}}{\$54} &= &\frac{81 \text{ lira}}{54} = \frac{9 \text{ lira}}{6} = \boxed{\frac{3}{2} \text{ lira}}
 \end{aligned}$$

1. If $x = \frac{1}{2}$, $y = \frac{1}{3}$, and $z = \frac{1}{4}$, determine exactly the value of

$\frac{x}{y+z}$. (MSHSML 2014-15 1A #1)

$$\frac{\frac{1}{2}}{\frac{1}{3} + \frac{1}{4}} \cdot \frac{12}{12} = \frac{6}{4+3} = \boxed{\frac{6}{7}}$$

Problem #2 ("textbook"; 2 points)

Try to solve each problem within two minutes.

2. Determine the exact value of $\frac{0.\overline{7}}{0.\overline{63}}$. [calculator allowed] (MSHSML 2015-16 1A #2)

$$\begin{aligned}
 \frac{0.\overline{7}}{0.\overline{63}} &= \frac{\frac{7}{99}}{\frac{63}{99}} = \frac{77}{63} = \frac{7 \cdot 11}{3 \cdot 3 \cdot 7} = \boxed{\frac{11}{9}}
 \end{aligned}$$

2. Express $0.\overline{037037037}\dots$ as a fraction $\frac{p}{q}$, where p and q are relatively prime integers. (MSHSML 2014-15 1A #2)

$$0.\overline{037} = \frac{37}{999} = \frac{37}{9 \cdot 111} = \frac{37}{3 \cdot 3 \cdot 37} = \boxed{\frac{1}{27}}$$

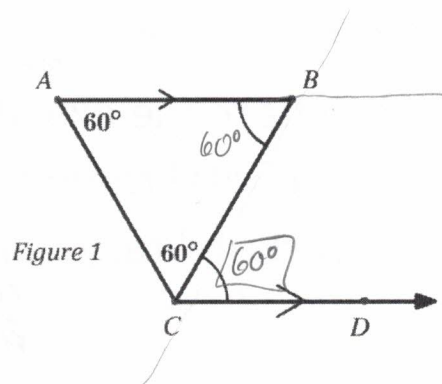
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Event B

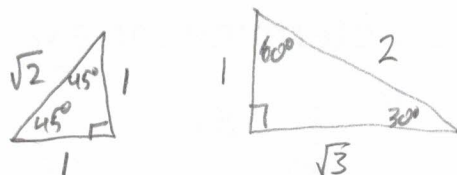
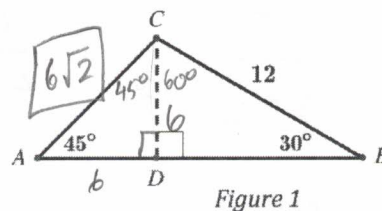
Problem #1 ("quickie"; 1 point)

Try to solve each problem within one minute.

1. In *Figure 1*, if $\triangle ABC$ is equilateral, and \overline{CD} is parallel to \overline{AB} , calculate the measure of $\angle BCD$. [calculator allowed]
 (MSHSML 2015-16 1B #1)



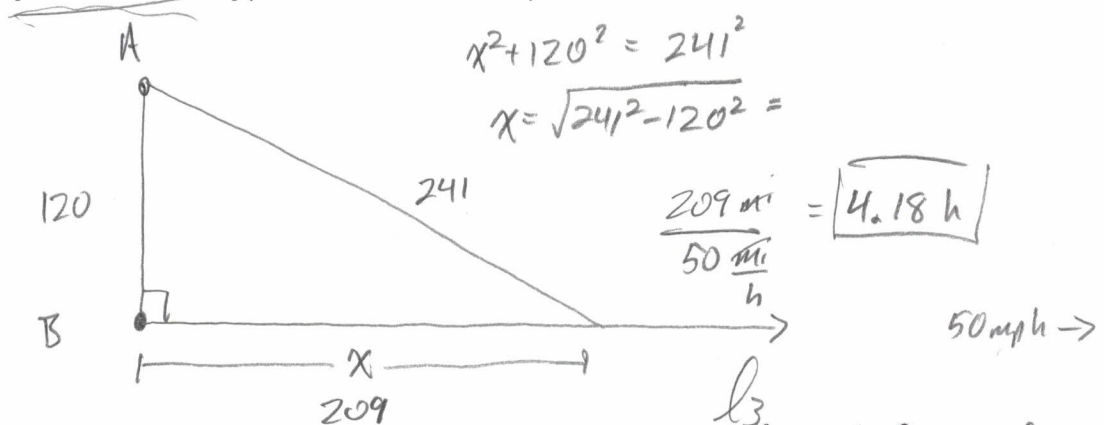
1. In $\triangle ABC$, $m\angle A = 45^\circ$ and $m\angle B = 30^\circ$ as shown in *Figure 1*. If $BC = 12$, determine exactly the length AC . [calculator allowed] (MSHSML 2014-15 1B #1)



Problem #2 ("textbook"; 2 points)

Try to solve each problem within two minutes.

2. Town A is located exactly 120 miles north of town B. If Sue hops in a car and drives directly east from town B at 50 mph, calculate how many hours (as a decimal) it will take for Sue to be exactly 241 miles from town A as the crow flies. [calculator allowed] (MSHSML 2015-16 1B #2)



2. In Figure 2, lines l_1 and l_2 are parallel, while lines l_3 and l_4 intersect at an angle of 17° . If the acute angle formed by l_1 and l_4 measures 44° , calculate the measure of the obtuse angle between l_1 and l_3 . [calculator allowed] (MSHSML 2014-15 1B #2)

