Event C

Problem #1 ("Quickie")

Try to solve each problem within one minute.

1. Determine exactly the value of $\sin\dfrac{\pi}{3} + \tan\dfrac{\pi}{4} + \cos\dfrac{\pi}{6}$.

(MSHSML 2019-20 1C #1)

1. Determine exactly the value of $\tan\dfrac{\pi}{6} + \cot\dfrac{\pi}{3}$.

(MSHSML 2018-19 1C #1)

Problem #2 ("Textbook")

Try to solve each problem within two minutes.

2. Determine exactly the smallest positive integer n such that $\sec(400°) \cdot \sin(n°) = 1$.

(MSHSML 2019-20 1C #2)

2. $\cot\theta = \dfrac{a^2 - b^2}{2ab}$ when $a > b > 0$ and $0° < \theta < 90°$. Write an expression for $\csc\theta$ in terms of a and b.

(MSHSML 2018-19 1C #2)

Event D

<u>Problem #1 ("Quickie")</u>

Try to solve each problem within one minute.

1. Given $f(x) = 3x^5 + 5x^3 - 2x^2 + 82$, determine exactly $f\left(f^{-1}(f(1))\right)$.

<div align="right">(MSHSML 2019-20 1D #1)</div>

1. Determine exactly all real solutions to the equation $x^2 + 8x = 8$.

<div align="right">(MSHSML 2018-19 1D #1)</div>

<u>Problem #2 ("Textbook")</u>

Try to solve each problem within two minutes.

2. $f(x) = x^2 + bx + 12$. Determine for how many integer values of b, $f(x)$ has non-real zeros.

<div align="right">(MSHSML 2019-20 1D #2)</div>

2. The solutions to $2x^2 + bx + c = 0$ are b and c, where neither is zero. Determine exactly the ordered pair (b, c).

<div align="right">(MSHSML 2018-19 1D #2)</div>