The key pad’s final “beep” echos quietly in the silent hall as the screen goes dark. “Did it work?” you ask. “Did the system accept the override?” A sly grin that makes you nervous spreads across your crew member’s face. “Only one way to find out” your crew member replies before taking off down the hallway towards the geology section of the museum. For one very long moment you hold your breath, waiting for the alarms and shouts, but they never come. All you can hear is your own heartbeat hammering in your ribs. As relief washes over you, a sigh escapes your lips, followed by a slow, satisfied smile. Then, you turn and follow your friend down the hall.

After a minute of quiet running, you see them up ahead, hiding behind a corner. They meet your eye and make a desperate hand signal, urging you to take cover. You don't hesitate, dropping to a crouch beneath a massive glass display case. Out of the corner of your eye, you see your third team member duck into a side hallway. You glance back towards the cat burglar hiding behind the corner; they’re trying to get your attention. Their lips move silently, forming the words, “Three guards, use the mirror.” Understanding suddenly dawns on you. You must’ve gone farther than you realized and already reached the guard station. With a nod, you all pull out your tactical mirrors, your only hope to keep things from turning ugly, and use them to peer around the corner.

Guard 1: In the plane mirror, the image of the first guard appears to be 8 meters away. How far away is the actual guard?

Guard 2: In the convex mirror, which you know has a magnification of 0.5 the image of the second guard appears to be 5 meters away. How far away is the actual guard?

Guard 3: With the concave mirror, which you know has a focal length of 0.48 m, you project the image of the second guard onto a blank sheet of paper. The paper is 0.5 m away from the mirror and the guard appears upside down. How far away is the actual guard?