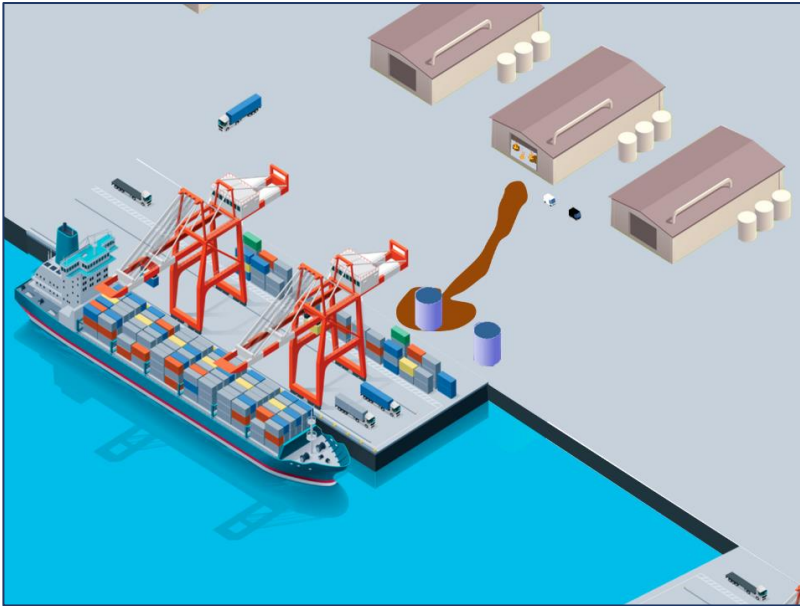


TIMING GUNSHOT SOUNDS WORKSHEET



THE SCENARIO

Drake and his sergeant are pinned down inside a burning warehouse at the port. The bad guys have just driven off, but they've left two nasty surprises – a sniper in a crane, and a torrent of fuel gushing from a fuel tank into the warehouse.

To escape, Drake needs to fire back against the sniper, but he has no idea how far away the sniper is.

QUESTION 1 (1 mark)

Drake uses his watch to record the time interval between seeing the muzzle flare of the sniper's gun and hearing the sound of the shot. If he makes the following 4 time recordings, what is the average recording?

1.24 seconds, 1.17 seconds, 1.56 seconds, 1.21 seconds

QUESTION 2 (2 marks)

Using your knowledge of outliers, which recordings if any should Drake probably discard? Does this change the average time recording, and if so what is the new average?

QUESTION 3 (1 mark)

Using this average time interval and assuming the speed of sound is 340 m/s, calculate how far away the sniper is located.

QUESTION 4 (3 marks)

If the bullet from the sniper's gun hits the container next to Drake 0.5 seconds before he hears the sound of the bullet being fired from the gun, what was the bullet's average speed? How many times faster than the speed of sound is the bullet going – what is its Mach number?