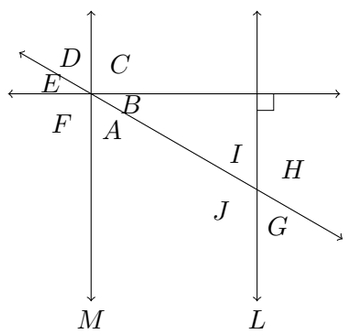
Math 123-01
Summer 2025
Dr. Lily Yen

Assignment 3

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ___/10

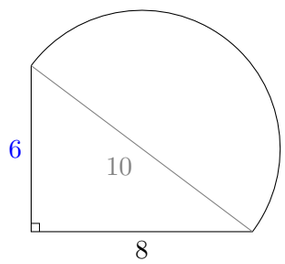
Problem 1: Lines L and M are parallel, cut by two transversals, one of which is perpendicular to L and M. Knowing that $\angle B$ is 25°, find $\angle E$, $\angle I$, and $\angle H$.



$\angle E = \angle B = 25°$;
$\angle I = 180° - 90° - \angle B = 90° - 25° = 65°$;
$\angle H = 180° - \angle I = 180° - 65° = 115°$.

Score: /3

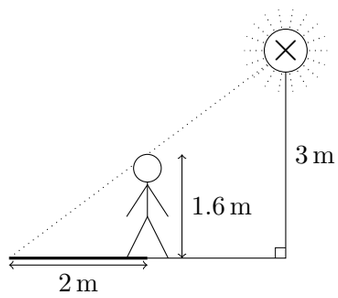
Problem 2: Find the combined area of a right triangle with a leg of 8 units and a semicircle drawn on its hypotenuse of 10 units. If necessary, round to nearest thousandths.



If the last side of the triangle has length x, the Pythagorean Theorem gives that $x^2 + 8^2 = 10^2$, so $x^2 = 10^2 - 8^2 = 36$, so $x = 6$. So the area of the triangle is $6 \times 8/2 = 24$. The semicircle's area is $\pi 5^2/2$. Thus combined area is $25\pi/2 + 24 \approx 63.27$ square units.
If instead, a combined perimeter is asked, then the semicircle has radius 5, so length $\frac{1}{2} \times 2\pi r = 5\pi$.
The perimeter is thus $6 + 8 + 5\pi = 14 + 5\pi \approx 29.708$.

Score: /3

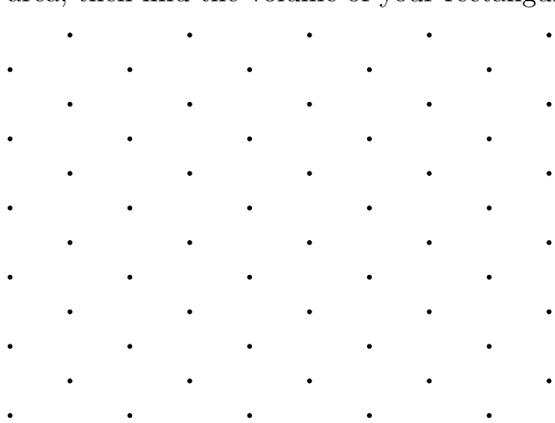
Problem 3: Shown is a 1.6 m tall pedestrian standing near a lamp post of 3 m high. If the pedestrian's shadow is 2 m long, how far away is the pedestrian standing away from the base of the lamp post?



If the distance from the pedestrian to the lamp post is x, then, by similar triangles, $\frac{x+2}{2} = \frac{3}{1.6}$, so $1.6(x+2) = 2 \times 3 = 6$, so $x + 2 = \frac{6}{1.6} = 3.75$, so $x = 1.75$ m.

Score: /2

Problem 4: In the three dimensional guide below, draw a rectangular prism of surface area between 50 square units and 100 square units. Show your work to calculate your surface area, then find the volume of your rectangular prism.



For example a $6 \times 4 \times 2$ box. In that case, the area is $2(6 \times 4 + 6 \times 2 + 4 \times 2) = 88$, and the volume is $6 \times 4 \times 2 = 48$.

Score: /2