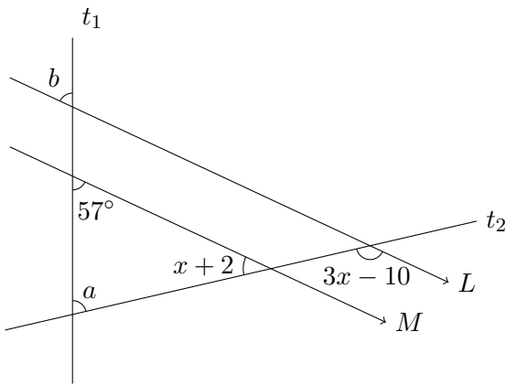
Math 123-02
Spring 2026
Dr. Lily Yen

Quiz 3

Show all your work

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

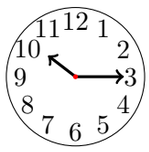
Problem 1: Lines L and M are parallel with transversals t_1 and t_2. Given an angle $57°$ as shown in the diagram, solve for x and find the angles $\angle a$ and $\angle b$.



Since $(x+2)+(3x-10)=180$, it follows that $4x-8=180$, so $4x=188$, so $x=47°$.
Moreover, $a+57+x+2=180$, so $a+57+49=180$, so $a=74°$.
And, clearly, $b=57°$.

Score: /4

Problem 2: Find the smaller angle formed by the hour hand and the minute hand at quarter past ten o'clock on a twelve-hour analogue clock. Show your work.



The hour hand moves at $\frac{1}{2}$ degree per minute. From 12:00 to 10:15 is $10\times 60+15=615$ minutes, so the hour hand is $307.5°$ from vertical.

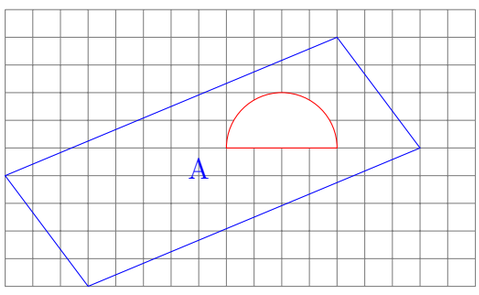
Similarly, the minute hand moves at $6°$ per minute, so from 10:00 to 10:15 it moves $15\times 6°=90°$ from vertical.
The angle between the hands is therefore $307.5°-90°=217.5°$ or $360°-217.5°=142.5°$.

Score: /2

Problem 3: Shown is Quadrilateral A on the grid.

a. Find the perimeter of the quadrilateral.

b. Draw a semi-circle of diameter 4 completely inside Quadrilateral A and find the area of the quadrilateral minus the semi-circle. Clearly state the area of the quadrilateral and the area of the semi-circle as part of your steps.



Since quadrilateral A's shorter side is the hypotenuse of a 3-4-5 triangle, the short side has length 5. The long side is part of a 5-12-13 triangle, so has length 13. In summary, the perimeter is $2\times(5+13)=36$.
Using the enclosing rectangle around quadrilateral A, we find
$9\times 15-3\times 4-5\times 12=135-12-60=63$ square units.
The semicircle has radius 2 so area $\frac{1}{2}\pi 2^2=2\pi$, so the desired area is $63-2\pi\approx 156.72$.

Score: /4