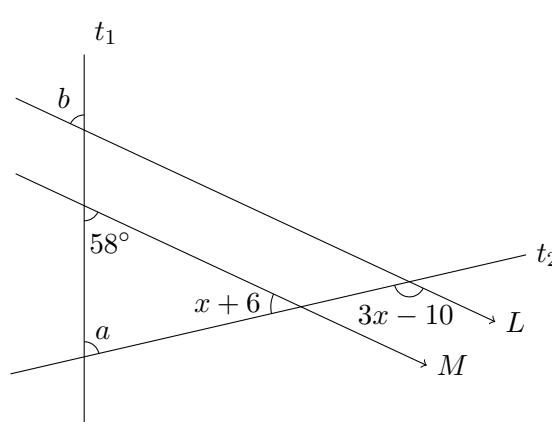


Quiz Three

Show all your work

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

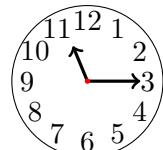
Problem 1: Lines L and M are parallel with transversals t_1 and t_2 . Given an angle 58° as shown in the diagram, solve for x and find the angles $\angle a$ and $\angle b$.



Since $(x + 6) + (3x - 10) = 180$, it follows that
 $4x - 4 = 180$, so $4x = 184$, so $x = 46^\circ$.
 Moreover, $a + 58 + x + 6 = 180$, so $a + 58 + 52 = 180$,
 so $a = 70^\circ$.
 And, clearly, $b = 58^\circ$.

Score: _____ /4

Problem 2: Find the smaller angle formed by the hour hand and the minute hand at quarter past eleven 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 11:15 is $11 \times 60 + 15 = 675$ minutes, so the hour hand is 337.5° from vertical.

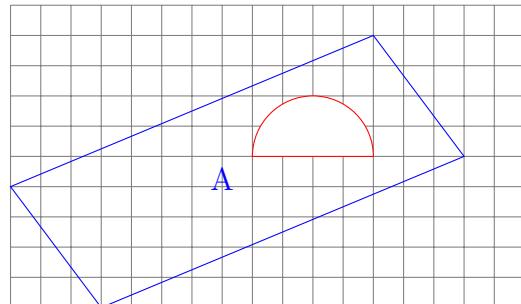
Similarly, the minute hand moves at 6° per minute, so from 11:00 to 11:15 it moves $15 \times 6^\circ = 90^\circ$ from vertical.

The angle between the hands is therefore $337.5^\circ - 90^\circ = 247.5^\circ$ or $360^\circ - 247.5^\circ = 112.5^\circ$.

Score: _____ /2

Problem 3: Shown is Quadrilateral A on the grid.

- Find the perimeter of the quadrilateral.
- Draw a semi-circle of radius 2 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

$$9 \times 15 - 3 \times 4 - 5 \times 12 = 135 - 12 - 60 = 63 \text{ square units.}$$

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