Lesson 15: The Distance from a Point to a Line

Classwork

Exercise 1

A robot is moving along the line $20x + 30y = 600$. A homing beacon sits at the point $(35, 40)$.

    a.   Where on this line will the robot hear the loudest ping?

    b.   At this point, how far will the robot be from the beacon?

Exercise 2

For the following problems, use the formula to calculate the distance between the point P and the line l.

$$d = \sqrt{\left(\frac{p + qm - bm}{1 + m^2} - p\right)^2 + \left(m\left(\frac{p + qm - bm}{1 + m^2}\right) + b - q\right)^2}$$

a. $P(0,0)$ and the line $y = 10$

b. $P(0,0)$ and the line $y = x + 10$

c. $P(0,0)$ and the line $y = x - 6$

Problem Set

1. Given $\triangle ABC$ with vertices $A(3, -1)$, $B(2,2)$, and $C(5,1)$.

    a.   Find the slope of the angle bisector of $\angle ABC$.

    b.   Prove that the bisector of $\angle ABC$ is the perpendicular bisector of $\overline{AC}$.

    c.   Write the equation of the line containing $\overline{AD}$.

2. Use the distance formula from today's lesson to find the distance between the point $P(-2,1)$ and the line $y = 2x$.

3. Confirm the results obtained in Problem 1 using another method.

4. Find the perimeter of quadrilateral $DEBF$ shown below.