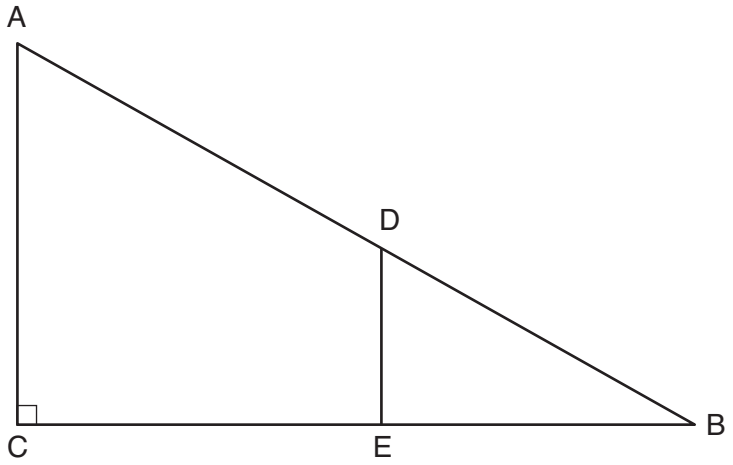
Use this space for computations.

6 In right triangle ABC shown below, point D is on $\overline{AB}$ and point E is on $\overline{CB}$ such that $\overline{AC} \| \overline{DE}$.



If $AB = 15$, $BC = 12$, and $EC = 7$, what is the length of $\overline{BD}$?

(1) 8.75
(2) 6.25
(3) 5
(4) 4

7 In rhombus $VENU$, diagonals $\overline{VN}$ and $\overline{EU}$ intersect at S. If $VN = 12$ and $EU = 16$, what is the perimeter of the rhombus?

(1) 80
(2) 40
(3) 20
(4) 10

Use this space for computations.

13 From a point on the ground one-half mile from the base of a historic monument, the angle of elevation to its top is 11.87°. To the *nearest foot*, what is the height of the monument?

(1) 543
(2) 555
(3) 1086
(4) 1110

14 The area of a sector of a circle with a radius measuring 15 cm is 75π cm^2. What is the measure of the central angle that forms the sector?

(1) 72°
(2) 120°
(3) 144°
(4) 180°

15 Point M divides $\overline{AB}$ so that $AM{:}MB = 1{:}2$. If A has coordinates $(-1,-3)$ and B has coordinates $(8,9)$, the coordinates of M are

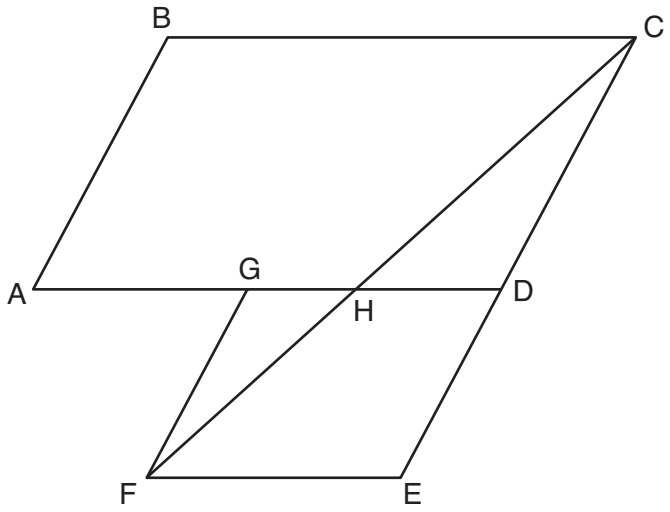
(1) $(2,1)$
(2) $\left(\frac{5}{3},0\right)$
(3) $(5,5)$
(4) $\left(\frac{23}{3},8\right)$

Part II

Answer all 7 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [14]

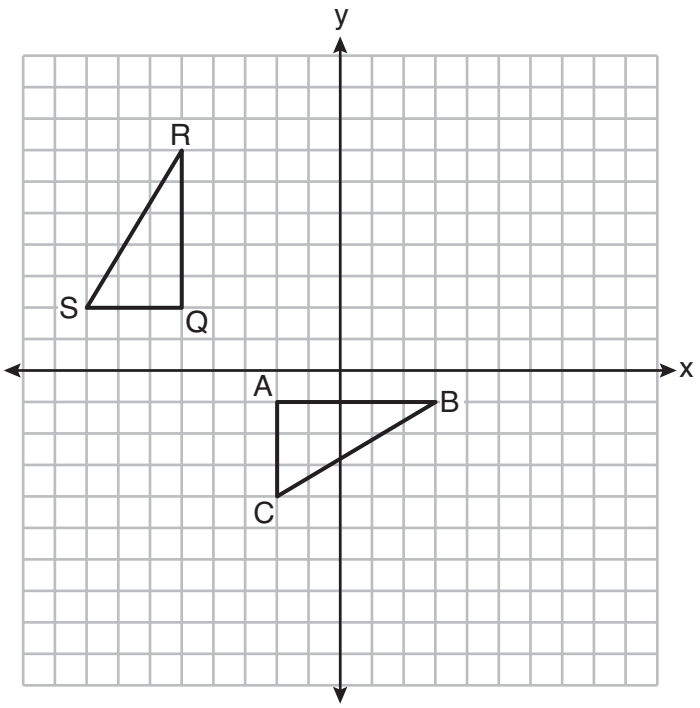
25 Write an equation of the line that is parallel to the line whose equation is $3y + 7 = 2x$ and passes through the point (2,6).

26 Parallelogram $ABCD$ is adjacent to rhombus $DEFG$, as shown below, and $\overline{FC}$ intersects $\overline{AGD}$ at H.



If $m\angle B = 118°$ and $m\angle AHC = 138°$, determine and state $m\angle GFH$.

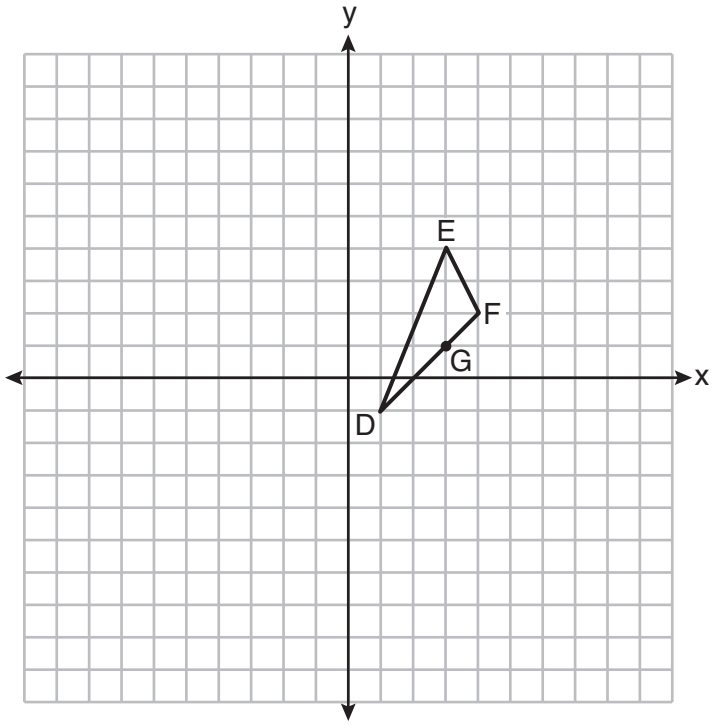
28 On the set of axes below, $\triangle ABC$ is graphed with coordinates $A(-2,-1)$, $B(3,-1)$, and $C(-2,-4)$. Triangle QRS, the image of $\triangle ABC$, is graphed with coordinates $Q(-5,2)$, $R(-5,7)$, and $S(-8,2)$.



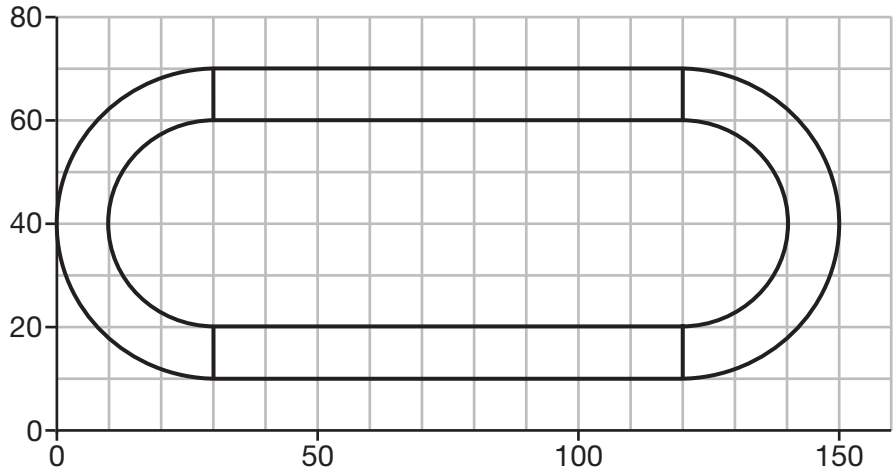
Describe a sequence of transformations that would map $\triangle ABC$ onto $\triangle QRS$.

30 On the set of axes below, $\triangle DEF$ has vertices at the coordinates $D(1,-1)$, $E(3,4)$, and $F(4,2)$, and point G has coordinates $(3,1)$. Owen claims the median from point E must pass through point G.

Is Owen correct? Explain why.



31 A walking path at a local park is modeled on the grid below, where the length of each grid square is 10 feet. The town needs to submit paperwork to pave the walking path. Determine and state, to the *nearest square foot*, the area of the walking path.



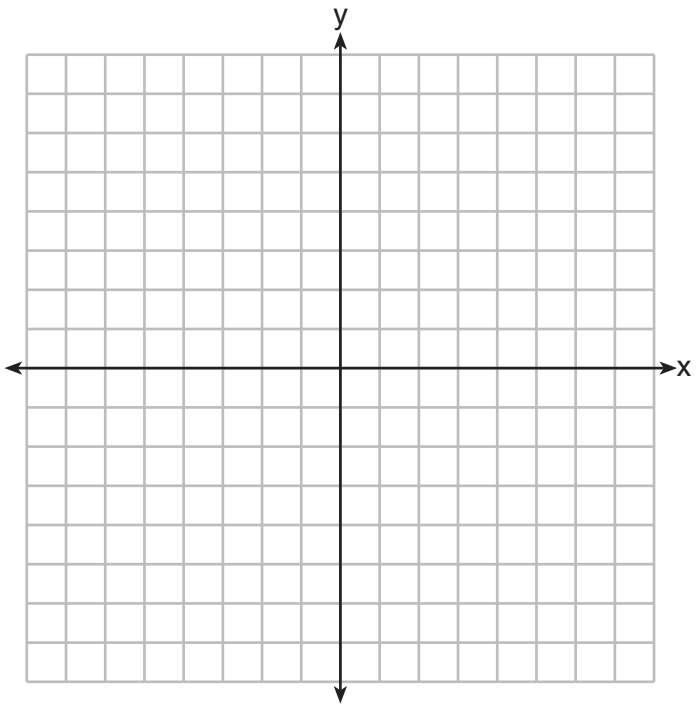
Part III

Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [12]

32 A triangle has vertices $A(-2,4)$, $B(6,2)$, and $C(1,-1)$.

Prove that $\triangle ABC$ is an isosceles right triangle.

[The use of the set of axes below is optional.]

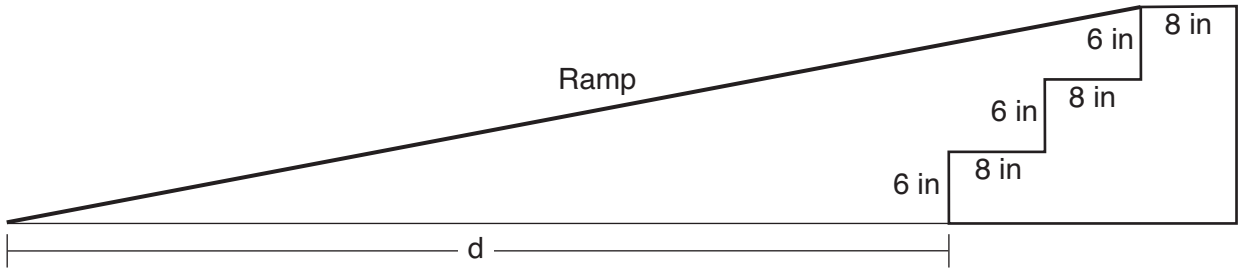


33 Theresa has a rectangular pool 30 ft long, 15 ft wide, and 4 ft deep. Theresa fills her pool using city water at a rate of $3.95 per 100 gallons of water.

Nancy has a circular pool with a diameter of 24 ft and a depth of 4 ft. Nancy fills her pool with a water delivery service at a rate of $200 per 6000 gallons.

If Theresa and Nancy both fill their pools 6 inches from the top of the pool, determine and state who paid more to fill her pool. [1 ft^3 water = 7.48 gallons]

34 As modeled in the diagram below, an access ramp starts on flat ground and ends at the beginning of the top step. Each step is 6 inches tall and 8 inches deep.



If the angle of elevation of the ramp is 4.76°, determine and state the length of the ramp, to the *nearest tenth of a foot*.

Determine and state, to the *nearest tenth of a foot*, the horizontal distance, d, from the bottom of the stairs to the bottom of the ramp.