Instructional Task 2 (MTR.4.1)

Part A. Write an "if...then" statement involving a quadrilateral.

Part B. Rewrite the statement as an "if and only if" statement. How are the two statements different in their meaning?

Instructional Items

Instructional Item 1

Puaglo said the following statements are valid. Select all the statements that are invalid.

a. All quadrilaterals have four right angles.
b. A triangle is a polygon with three sides.
c. All circles are similar.
d. All equiangular quadrilaterals are congruent.
e. A trapezoid must have at least one obtuse angle.

35

Instructional Item 2

The equation of a circle is given.

(3, -4)

Part A Determine the center and the radius of the circle. $x^2 + y^2 - 6x + 8y + 5 = 0$ √20 or 2√5

Part B Sketch the graph of the circle on the coordinate plane.

Part C What is the ordered pair that contains the maximum y-value of the circle?

3, √20 − 4

3, 2√5 − 4

graph

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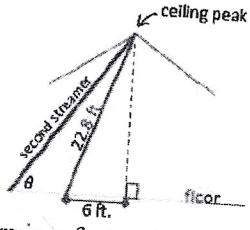
Instructional Items

Instructional Item 1

Belle is hanging streamers for her brother's surprise birthday party. She secures two streamers of different lengths at the peak of the ceiling. The center of the floor is directly underneath the ceiling peak. The distance along the floor from the center of the room to where the first streamer is attached is 6 feet. The second streamer is attached to the floor further from the center of the floor than the first streamer.



The distance between the streamers is x feet and the length of the second streamer is y feet. The angle formed between the second streamer and the floor is θ. Select all of the equations that are true to the nearest tenth based on the diagram.

a. $\sin\theta = \frac{22.0}{y}$

b. $\sin\theta = \frac{22.8}{y}$

c. $\tan\theta = \frac{22.0}{6}$

d. $\cos\theta = \frac{x}{y}$

e. $\cos\theta = \frac{x+6}{22.8}$

f. $\tan\theta = \frac{22.0}{x+6}$

g. $\sin\theta = \frac{22.0}{22.8}$

h. $\tan\theta = \frac{22.8}{x}$

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Instructional Items

Instructional Item 1

The International Space Station (ISS) passes over the earth 248 miles above the earth's surface. The angle formed between the two tangents formed from the ISS and the earth measures 140.4°. What is the measure of the arc of the earth that could have a view of the ISS passing overhead?

39.6°

$140.4 = \frac{1}{2}(360 - x - x)$

$x = 39.6$

$360 - x$

$140.4 = \frac{1}{2}(360 - 2x)$

$280.8 = 360 - 2x$

$-79.2 = -2x$

Instructional Items

Instructional Item 1

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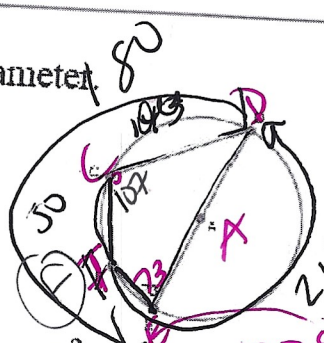
In circle A, segment DE is a diameter.



ALE is 73°

Part A. Determine the measure of angle C. 107°

Part B. If the measure of arc CF is 50°, determine the measures of angle D and angle F.

Instructional Item 2

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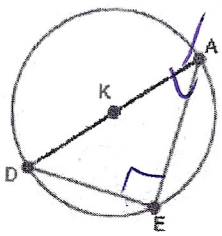
Triangle DAE is inscribed in Circle K.



$2x - 20$

$2(30) - 20$

$60 - 20$

40

250

155

42°

Part A. Determine the value of x if the measure of angle E is $(2x + 30)°$. $x = 30$

Part B. Determine the measure of angle D if the measure of angle A is $(2x - 20)°$.

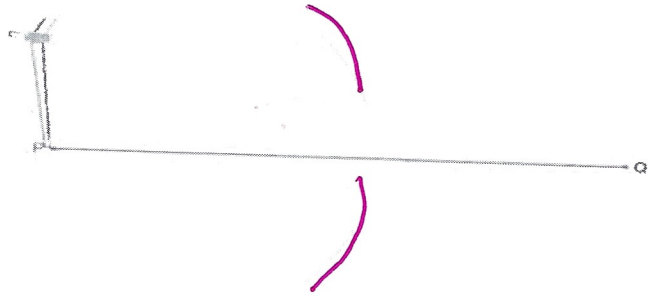
50

24

perpendicular bisector

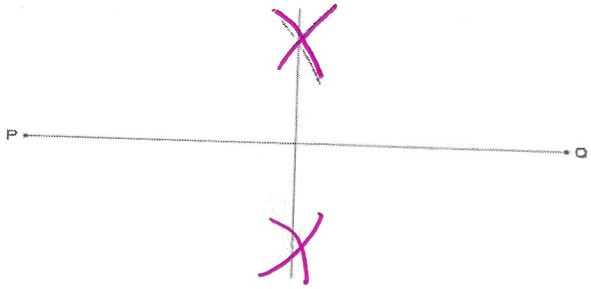
Which construction is shown? Number the correct order of the construction #1-5.

3 Without changing the compasses' width, draw an arc above and below the line.



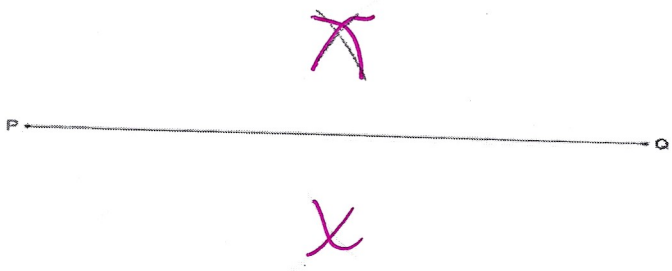
1 Place the compasses on one end of the line segment.

5 Using a straightedge, draw a line between the points where the arcs intersect.



2 Set the compasses' width to a approximately two thirds the line length. The actual width does not matter.

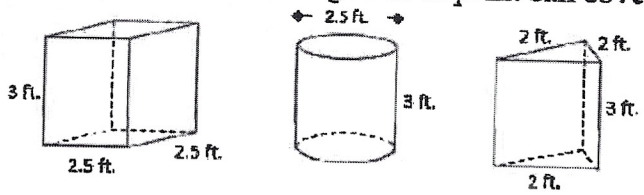
4 Again without changing the compasses' width, place the compasses' point on the the other end of the line. Draw an arc above and below the line so that the arcs cross the first two.



Instructional Items

Instructional Item 1

Kristin and Rachel are hosting an art show where they will showcase local artists' sculptures. They are painting pedestals upon which the sculptures will be placed. Pictures of the pedestals they will be using are below. One gallon of paint can cover 400 square feet.



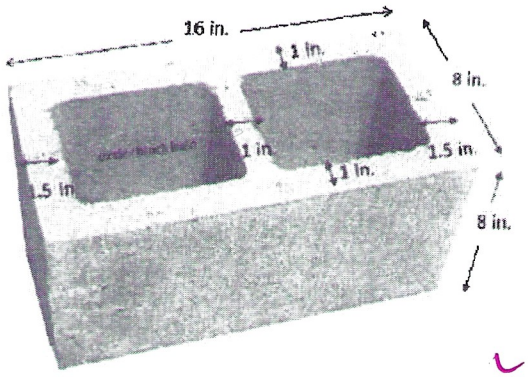
Part A. How many gallons of paint will they need to purchase to cover at least 4 of each type of pedestal? Assume that the base of each will not be painted.

Part B. If there is any paint left over, determine how many of which shape pedestals could be painted.

Instructional Items

Instructional Item 1

Joshua is going to create a garden border around three sides of his backyard deck using cinder blocks. He is going to plant a flower in each hole of the cinder block. The dimensions of the cinder blocks are 8 inches by 16 inches by 8 inches. Each hole needs to be completely filled with potting soil before the flowers can be planted. Potting soil is sold in 1 cubic foot bags.



Part A. What are the dimensions of a cinder block hole?

Part B. The patio is a square with a side length of 8 feet. One of the sides of the square patio is adjacent to an exterior wall of the house. If Joshua puts blocks around the other three sides of the patio, how many bags will Joshua need to purchase to fill the blocks?

AA
SSS
SAS

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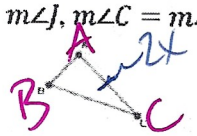
Instructional Items

Instructional Item 1

In triangles ABD and JKL, $m\angle A = m\angle J$, $m\angle C = m\angle L$, and $\overline{AC} = 2\overline{JL}$.



$\frac{1}{2}$

Dilation $k=\frac{1}{2}$
Rotation

Part A. Describe a sequence of transformations that maps ΔABC onto ΔJKL.

Part B. Based on the transformations chosen, determine whether ΔABC is congruent or similar to ΔJKL.

AA Sim. or ~~SAS~~ ~~ASA~~

Instructional Items

Instructional Item 1

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What point on the number line is $\frac{7}{9}$ the way from the point -3.6 to the point 10?

$\times 13.6 = 10.578$

$-3.6 + 10.578$

6.98

6.98

Instructional Items

Instructional Item 1

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Points A (0,2) and B (2,0) are endpoints of segment AB, the side of quadrilateral $ABCD$. List possible coordinates for points C and D if quadrilateral $ABCD$ is a rhombus, not a square.

NOT

& see graph

Instructional Item 2

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Given quadrilateral $ABCD$ with vertices $(-3,-4)$, $(1,5)$, $(5,3)$, and $(5,-8)$, respectively, classify the type of quadrilateral.

& see graph

trapezoid

Instructional Items

8

Instructional Item 1

A triangle whose vertices are located at $\left(\frac{2}{7}, -1\right)$, $\left(-4, -\frac{14}{5}\right)$ and $(3,1)$ is shifted to the right 2 units.

Part A. What are the coordinates of the triangle after the translation?

Part B. Describe the transformation that would map the preimage to the image algebraically.

Instructional Items

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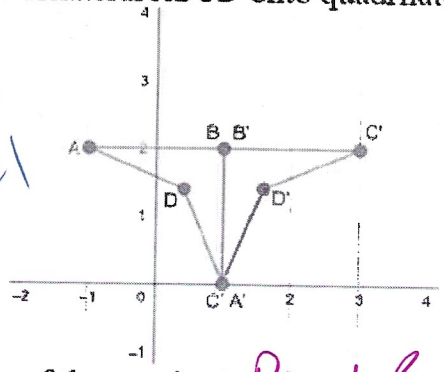
Instructional Item 1

A single rotation mapped quadrilateral $ABCD$ onto quadrilateral $A'B'C'D'$.



Part A. What is the center of the rotation?

Part B. If the rotation is counterclockwise, how many degrees is the rotation?

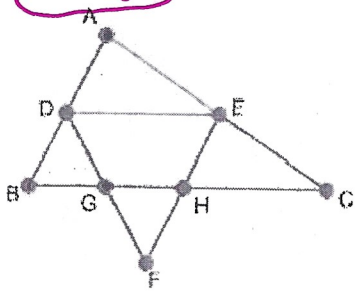
Part C. Describe another transformation that maps quadrilateral $ABCD$ onto quadrilateral $A'B'C'D'$.

3

Instructional Items

Instructional Item 1

$\overline{GH}$ is a midsegment of triangle DEF and $\overline{DE}$ is a midsegment of triangle ABC. If $GH = 1.5$ cm, what is the length of segment BC? 6



4

Instructional Items

Instructional Item 1

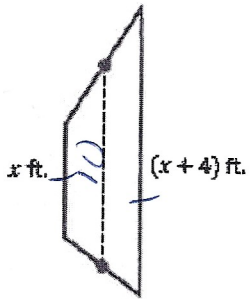
Given parallelogram $WXYZ$, where $WX = 2x + 15$, $XY = x + 27$ and $YZ = 4x - 21$, determine the length of ZW, in inches. 45

5

Instructional Items

Instructional Item 1

Tulips should be planted three inches apart to give a full look. The Starlings have a trapezoidal plot for a flower garden, as shown in the figure. They are going to put tulips along the parallel sides of the garden. The midsegment to the garden is 10 feet long. Tulips are sold in bags of 25 bulbs.



Part A. What are the lengths of the parallel sides of the garden? 8 and 12

Part B. How many tulips are needed to line the parallel sides? 80 82

Part C. What is the minimum number of bags the Starlings need to purchase to have enough bulbs to line the parallel sides of the garden? 4