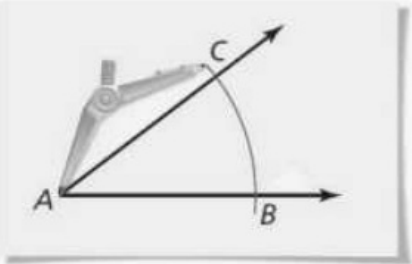Order the steps to construct an angle bisector of $\angle A$ with a compass and a straightedge.

A	Step 1	
B	Step 2	
C	Step 3	

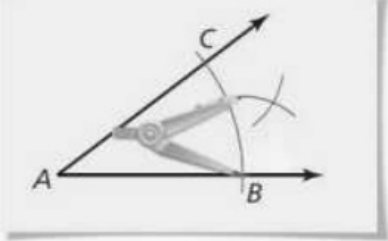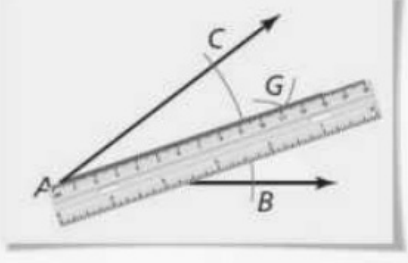Correct answers:

Draw an arc Place the compass at A. Draw an arc that intersects both sides of the angle. Label the intersections B and C.

Draw arcs Place the compass at C. Draw an arc. Then place the compass point at B. Using the same radius, draw another arc.

Draw a ray Label the intersection G. Use a straightedge to draw a ray through A and G.

1 possible pt.

QUESTION 2: FILL IN THE BLANK DROPDOWN

Identify whether each transformation of a polygon preserves distance and/or angle measure.

	Preserves Distance?	Preserves Angle Measure?
A clockwise rotation about the origin.	1	2
A dilation by 3.	3	4
A reflection over the line $y = -1$.	5	6
A translation up 4 units and left 5 units.	7	8

Correct answers:

1 Yes	2 Yes	3 No	4 Yes	5 Yes	6 Yes	7 Yes	8 Yes

1 possible pt.

QUESTION 3: MULTIPLE CHOICE

Rigid Motion Preserves Distance:
The following Transformations are considered Rigid Motion since they maintain the same shape/size preserving the same distance & angles.

TRANSLATION, REFLECTION, ROTATION

*Dilations DO NOT preserve distance since the sides change distance measures, but the angles do stay the same. Therefore, Dilations are NOT Rigid Motion.

Louisa and Dante are trying to construct the circumscribed circle of a triangle. To find the center, Louisa constructs the perpendicular bisectors of two sides of the triangle. Dante constructs all three altitudes of the triangle to find the center. Which statement is true?

A ◯ Louisa is incorrect because she only found two of the perpendicular bisectors.

B ◯ Dante is incorrect because he found the centroid, not the circumcenter.

C ✓ Louisa is correct because the circumcenter is the intersection of the perpendicular bisectors.

D ◯ Dante is correct because he found all three altitudes.

◀   ▶

1 possible pt. / penalty score: 100%.

QUESTION 4: MATH SHORT ANSWER

Find the value of x.
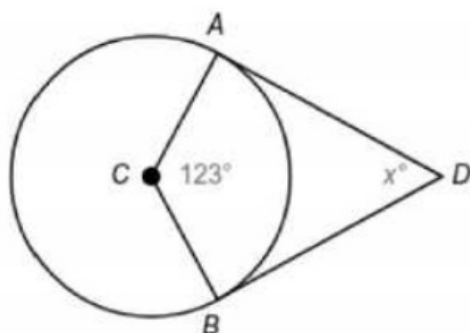
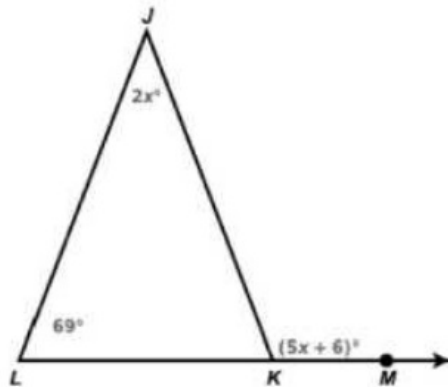
Opposite angles are supplementary
so 180-123 = 57

1 possible pt.

QUESTION 5: MATH SHORT ANSWER

$\triangle JLK$ lies on $\overrightarrow{LM}$. **Find the measure of** $\angle JKM$.

Remember the two Remote Interior Angles are equal to the exterior angle.

5x+6=69+2x

3x = 63

x = 21

Next substitute in 21 for x to determine angle JKM

5(21) +6 = 111

1 possible pt.

QUESTION 6: FILL IN THE BLANK DROPDOWN

The coordinates for $\triangle XYZ$ and $\triangle X'Y'Z'$, use the dropdown boxes to represent the rule for the transformation.

$\triangle XYZ$	$\triangle X'Y'Z'$
$X(-4, -1)$	$X'(-1, -1)$
$Y(-1, 2)$	$Y'(2, 2)$
$Z(2, -4)$	$Z'(5, -4)$

*Also graph to prove translation

- $(x, y) \rightarrow ($ [1] , [2] $)$

Correct answers:

1 $x + 3$	2 y

1 possible pt.

QUESTION 7: FILL IN THE BLANK DROPDOWN

Identify and describe the solid produced by rotating the figure around the given axis.

18

7
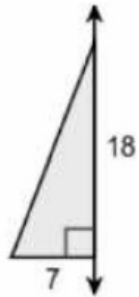
- The solid is a [1 _____] with a height of [2 _____] and a radius of [3 _____]

  units.

Correct answers:

| 1 cone | 2 18 | 3 7 |

1 possible pt.

QUESTION 8: FILL IN THE BLANK DROPDOWN

About 75,000 people live in a circular region with a 10-mile radius.

Part A: What is the area of the circular region? `1` [   ]

Part B: What is the population density in people per square mile? `2` [   ]

Correct answers:

`1` about 314.2 square miles   `2` about 239 people per square mile

1 possible pt.

$A = \pi r^2$

$A = 3.14(10)^2$

$3.14(100) = 314.2$ sq miles

QUESTION 9: FILL IN THE BLANK DROPDOWN

Density = Mass/Volume
(people/area)
Density = 75000/314.2 = 239 people

Describe a transformation that maps $\triangle ABC$ to $\triangle A'B'C'$.
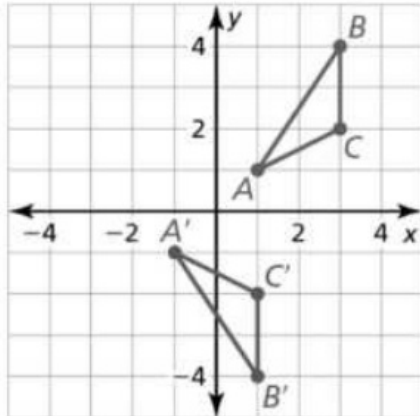
- One possible transformation is a [1   ] , followed by a [2   ] .

Correct answers:

1	reflection in the x-axis	2	translation 2 units left

(x-2,y)

1 possible pt.

QUESTION 10: FILL IN THE BLANK DROPDOWN

Prism A and Prism B are similar.
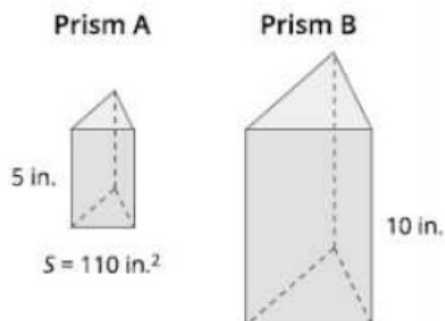
Prism A   Prism B

Scale factor remember: <u>N</u>   <u>new</u>
                             O   original

5 in.

10 in.

$S = 110$ in.^{2}

Part A: What is the scale factor from Prism A to Prism B? [1] $\dfrac{10}{5} = 2$

Part B: What is the surface area of Prism B? [2]

Correct answers:

| 1 | 2 | 2 | 440 sq. in. |

1 possible pt.

SA=2B+ph , where SA stands for surface area, B stands for the area of the base of the prism, p stands for the perimeter of the base, and h stands for height of the prism

QUESTION 11: FILL IN THE BLANK TEXT

SA = is given for the first one so all you have to do is multiply by 2 twice since it's area so 110 X 2 X 2 = 440.

Perimeter is only one dimension so only times 2 once,
Area is two dimension so times 2 twice.
Volume is three dimension mulitply 2 three times.

The equation of a circle is: $x^2 + y^2 + 2x + 10y + 10 = 0$.

What is the domain and range of the circle?

- Domain: ^{1} _____ $\leq x \leq$ ^{2} _____

- Range: ^{3} _____ $\leq y \leq$ ^{4} _____

Correct answers:

1	-5	2	3	3	-9	4	-1

1 possible pt.

$(x-h)^2 + (y-k)^2 = r^2$
Equation of a Circle

*See graph at the end of the notes.

Domain is your x values
Range is your y values

QUESTION 12: FILL IN THE BLANK TEXT

Find the coordinates of point P along the directed segment AB so that AP to PB is the given ratio.

$A(-7, -5)$ $B(-2, 0)$; **1 to 4**

*eyeglass method

- The coordinates of P are (^{1} _____ , ^{2} _____)

Correct answers:

1	-6	2	-4

1 possible pt.

$^-7$ $^-2$

$\dfrac{-28-2}{1+4}$ $\dfrac{-30}{5}$ = -6

QUESTION 13: FILL IN THE BLANK TEXT

$^-5$ 0

$\dfrac{-20+0}{1+4}$ = $\dfrac{-20}{5}$ = -4

Find AD.
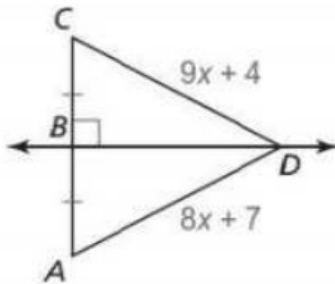
- $AD = $ ___1___ _____

Correct answers:

1	31

1 possible pt.

any point on the perpendicular bisector is equal distant to the endpoints.
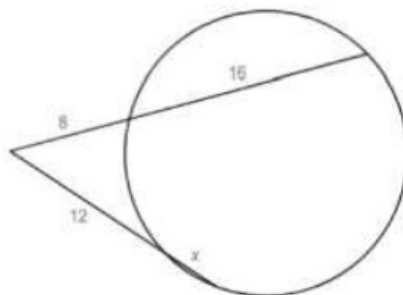
$9x + 4 = 8x + 7$

$x = 3$

*Then plug in $9(3) + 4$

$27 + 4 = 31$

and $8(3) + 7 = 31$

QUESTION 14: MATH SHORT ANSWER

Find the value of x.

$12(x + 12) = 8 (8 + 16)$

$12x + 144 = 8(24)$

$12x + 144 = 192$

$12x = 48$

$x = 4$

1 possible pt.

QUESTION 15: FILL IN THE BLANK DROPDOWN

String A and String B are attached to the top of a 21-foot pole and are anchored to the ground. String A forms

a 30° angle with the ground, and String B is anchored 20 feet away from the base of the pole. Determine which

string is longer, and by how much.

String B is [1 |　　　　]　　　 than string A by [2 |　　　　] .

Correct answers:

[1　shorter] [2　13]

1 possible pt.

$c^2 = a^2 + b^2$

$c^2 = 20^2 + 21^2$
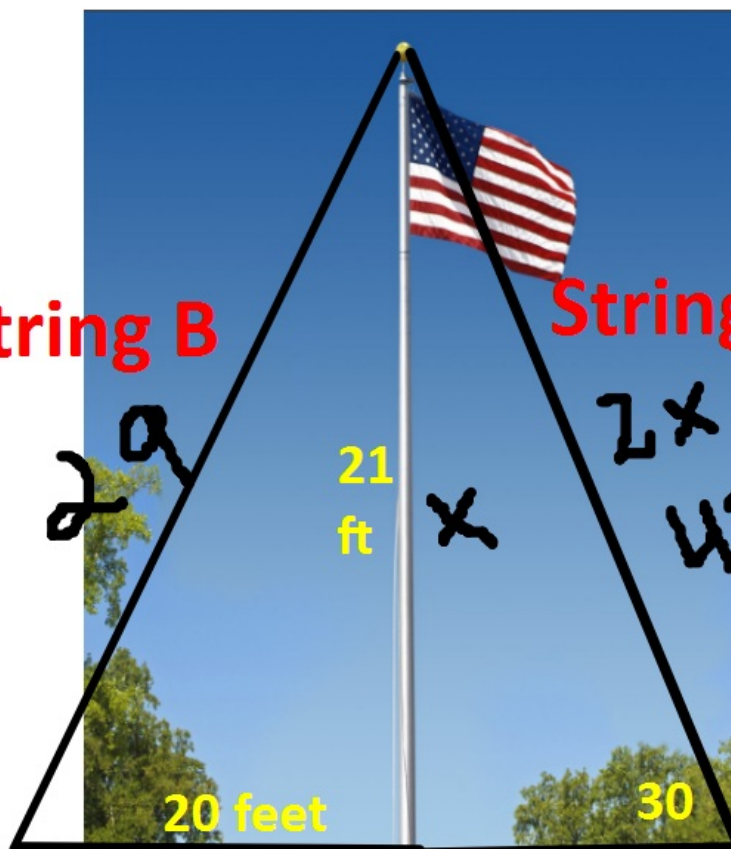
$c^2 = 400 + 441$

$c^2 = 841$

square root of 841 = 29 ft

42 ft - 29ft = 13 ft

String B is shorter

String B

2a

21 ft

x

20 feet

String

2x

4?

30

Step 1

Rearrange the equation and prepare to complete the square.   **The equation of a circle is:** $x^2 + y^2 + 2x + 10y + 10 = 0.$

Group x and y terms:

- $x^2 + 2x + y^2 + 10y = -10$

Step 2   ⌃

Take half of the coefficient of x (which is 2), square it ($\left(\frac{2}{2}\right)^2 = 1$), and add it to both sides:

- $x^2 + 2x + 1 + y^2 + 10y = -10 + 1$

Step 3   ⌃

Take half of the coefficient of y (which is 10), square it ($\left(\frac{10}{2}\right)^2 = 25$), and add it to both sides:

- $x^2 + 2x + 1 + y^2 + 10y + 25 = -10 + 1 + 25$

Step 4

Factor the perfect square trinomials and simplify the right side:

- $(x + 1)^2 + (y + 5)^2 = 16$

Step 5

Compare the equation to the standard form:

- Center: $(-1, -5)$
- Radius: $r = \sqrt{16} = 4$

The equation of a circle is: $x^2 + y^2 + 2x + 10y + 10 = 0.$

Domain is your x values
Range is your y values

-5≤x≤3

3≤y≤-1

Step 4

Factor the perfect square trinomials and simplify the right side:

- $(x+1)^2 + (y+5)^2 = 16$

Step 5

Compare the equation to the standard form:

- Center: $(-1, -5)$
- Radius: $r = \sqrt{16} = 4$