Geometry Placement Instructions

This assessment will help determine if this level of Math-U-See is a good place for your child to start. Each level of Math-U-See builds upon the concepts taught in previous levels. Successful placement involves finding the highest level your child has fully mastered and placing them one level above that.

1 Prior to beginning the assessment:

- Understand that the goal isn't to get all the questions correct. We are determining which concepts they have not yet mastered.
- Encourage your child and let them know that this is an assessment and NOT a test.
- Recognize they might already know some of the concepts taught in this level.
- Let your child know there may be questions they don't yet understand.
- Print the assessment and ensure you have a pencil and eraser.
- Your child may want extra paper to work through the questions.

2 Let your child know while taking the assessment:

- If they don't understand or can't do a question have them move to the next one.
- If they want to attempt a question but are not sure they understand it, have them mark it with a happy face.
- If they cannot answer 3 or more questions in a row, it is okay to stop doing this assessment.

3 Grading the assessment:

- A question that your child has marked with a happy face indicates to you that this concept is not completely understood and must be reviewed.
- For incorrect answers, ask your child how they arrived at their answer. If they understand the concept, they should be able to correct the mistake on their own. This is considered a computational error. For the sake of this assessment do not mark this as incorrect.
- If there are only one or two concepts they need to learn or review from a given level, it may be possible to just remediate those and start in the next level higher.

4 Analyzing the results:

Most answers are incorrect or have happy faces.	5 or more answers are incorrect or have happy faces.	Most answers are correct and there are no happy faces.
Have them try the assessement for	**Your child is ready for**	**Have them try the assessment for**
Algebra 1	**Geometry**	**Algebra 2**

If you have questions after your child has taken the assessment, please contact us with the results and we will be able to help you determine the best level for them.

FINAL EXAM

I. Fill in the blank with the bestanswer.(3 pointseach)

1. _____Thetrigonometric function defined as “the adjacent side over the hypotenuse.”

2. _____Anangle with a measure greater than 90º but less than 180º.

3. _____Apiece of the circumference of a circle.

4. _____Anytwo angles whose measures add to 90º.

5. _____Aninfinite number of connected lines lying in the same flat surface; it has length and width; two dimensional.

6. _____Afour-sided polygon with two parallel sides and two sides that are not parallel.

7. _____Arectangular solid with all edges having the same length.

8. _____Twoor more points in the same line.

9. _____Havingthe same size and shape.

10. _____Distancearound any two-dimensional geometric shape.

II. Given the drawing at right, answer the following questions.(3 points each)

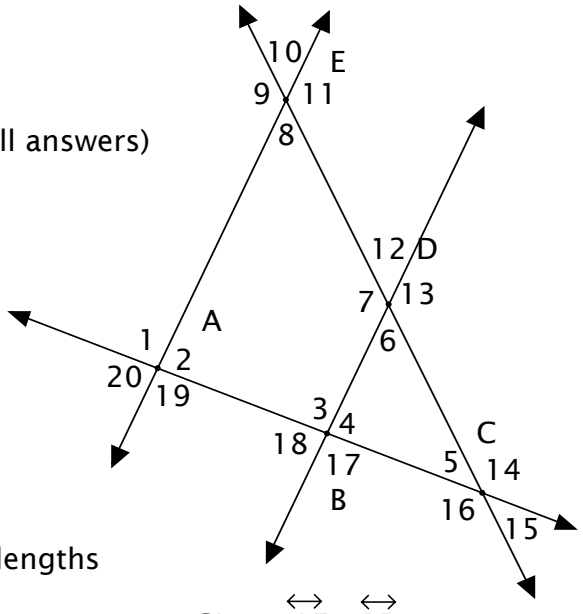
1. What kind of quadrilateral is quadrilateral ABDE?

2. What angle(s) correspond(s) to $\angle 10$? (give all answers)

3. $m\angle 6 =$ ____°

4. $m\angle 5 =$ ____°

5. Given that segment DC is 8 inches, find the lengths of the other two sides of triangle BCD.



Given: $\overleftrightarrow{AE} \parallel \overleftrightarrow{BD}$

$m\angle 8 = 60°$

$m\angle 4 = 90°$

6. $m\angle 14 =$ ____°

7. Is $m\angle 2 = m\angle 11$? Why or why not?

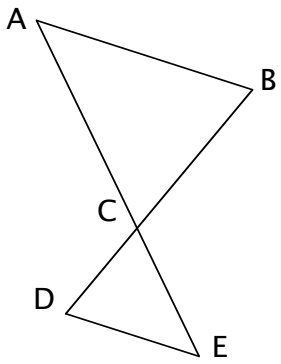
8. Name all the labeled points that are not collinear with point B in the drawing.

9. For $\Delta BCD \sim \Delta ACE$, use your answers from #5 above and find the length of the segment AE if CE = 20.

10. Using your answers from #5 and #9, what is the length of segment AB?

III. Write a proof for each of the following. (12 points each)

1.



Given: $\overline{CE} \cong \overline{CA}$

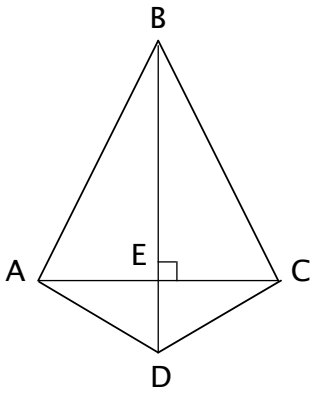
$\angle ABC \cong \angle EDC$

Prove: $\Delta ABC \cong \Delta CDE$

The drawing is a sketch and is not to scale.

Statements	Reasons

2.

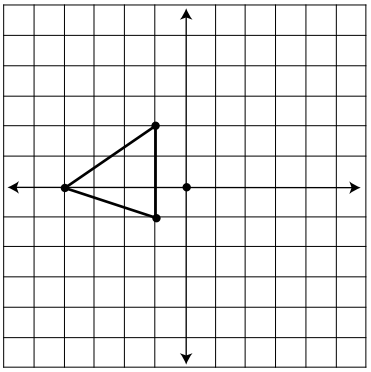


Given: $\overline{AB} \cong \overline{BC}$

Prove: $\overline{AE} \cong \overline{EC}$

Statements	Reasons

IV. Graph the reflection of the triangle about the Y–axis. (5 points)



V. Find the volume of a sphere if the radius is given as 3 cm. (5 points)

VI. Find the surface area of a rectangular solid with edges of lengths 2 cm, 5 cm, and 7 cm. (5 points)

VII. The measure of an exterior angle of a regular polygon is 45º. Name the shape of the polygon. (5 points)

VIII. Simplify the following radical expressions, if possible. Reduce to the simplest terms. (4 points each)

1. $\left(3\sqrt{2}\right)\left(4\sqrt{2}\right) =$

2. $\frac{4}{\sqrt{3}} - \frac{2\sqrt{6}}{\sqrt{2}} =$

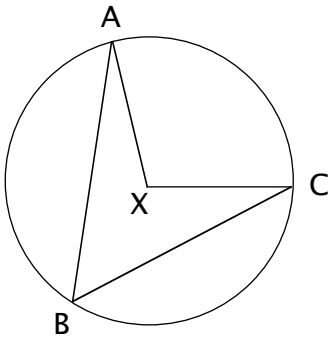
3. $-3\sqrt{5} + \sqrt{5} =$

4. $\sqrt{2} + \sqrt{3} + \sqrt{4} + \sqrt{1} =$

IX. Given that the circumference of a circle is 8π, find the radius. (5 points)

X. Draw a segment four inches long. Now construct the perpendicular bisector to that segment. Measure your results to check. (5 points)

XI. If the length of the minor arc AC in the diagram below is 98º, give the measures of the central angle and the inscribed angle shown. (5 points)



Given: X is the center of the circle.

XII. If the hypotenuse of a right triangle is 5 cm and one leg is 2 cm, what is the measurement of the other leg? (5 points)

XIII. Given that $\sin\theta = \frac{3}{5}$, find the values of the other 5 trigonometry functions. (10 points)

Geometry Pre/Post Placement Test
Answer Key

I

1. cosine
2. obtuse
3. arc
4. complementary
5. plane
6. trapezoid
7. cube
8. collinear
9. congruent
10. perimeter

II

1. trapezoid
2. $\angle 12$
3. $m\angle 6 = m\angle 8 = 60°$
   corresponding angles
4. $m\angle 5 = 180° - (m\angle 4 + m\angle 6) =$
   $180° - (60° + 90°) =$
   $180° - 150° = 30°$
5. $\triangle BDC$ is a $30°-60°-90°$ triangle
   hypotenuse $= 8$ in
   $\overline{BD}$ (short leg) $= 8 \div 2 = 4$ in
   $\overline{BC}$ (long leg) $= 4\sqrt{3}$
6. $m\angle 14 = 180° - m\angle 5 =$
   $180° - 30° = 150°$
7. no, line EC is not parallel to line AC
8. point E
9. Let X = length of $\overline{AE}$
   $\frac{20}{8} = \frac{X}{4}$
   $8X = (4)(20)$
   $8X = 80$
   $X = 10$
10. First find length of $\overline{AC}$:
    $\triangle EAC$ is a $30°-60°-90°$ triangle,
    so the long leg is $\sqrt{3}$ times
    the short leg or $10\sqrt{3}$
    $AB = AC - BC = 10\sqrt{3} - 4\sqrt{3} = 6\sqrt{3}$

III

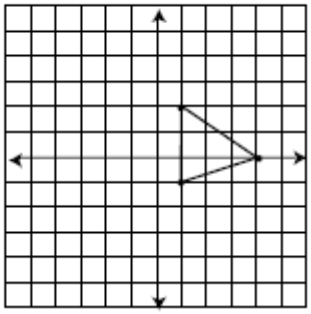
1.

$\overline{CE} \cong \overline{CA}$	given
$\angle ABC \cong \angle CDE$	given
$\angle ACB \cong \angle DCE$	vertical angles
$\triangle ABC \cong \triangle CDE$	AAS

2.

$\overline{AB} \cong \overline{BC}$	given
$\angle BEC$ is a right angle	given
$\angle BEA$ is a right angle	supplementary
$\overline{BE} \cong \overline{BE}$	reflexive property
$\triangle ABE \cong \triangle CBE$	HL
$\overline{AE} \cong \overline{CE}$	CPCTRC

IV.



V

$V = \frac{4}{3}\pi r^3 \approx \frac{4}{3}(3.14)(3^3)$

$= 113.04 \text{ cm}^3$

If the fractional value of π is used, the answer would be 113.14 cm^3.

VI

$SA = 2(2)(5) + 2(2)(7) + 2(5)(7) =$
$20 + 28 + 70 = 118 \text{ cm}^2$

VII

$360°$ total of all angles
$360° \div 45° = 8$ sides; octagon

VIII

1. $(3\sqrt{2})(4\sqrt{22}) = (3)(4)\sqrt{2}\sqrt{22} = 12\sqrt{44} = 12\sqrt{4}\sqrt{11} = 12(2)\sqrt{11} = 24\sqrt{11}$
2. $\frac{4}{\sqrt{3}} - \frac{2\sqrt{6}}{\sqrt{2}} = \frac{4\sqrt{3}}{\sqrt{3}\sqrt{3}} - \frac{2\sqrt{3}}{1} = \frac{4\sqrt{3}}{\sqrt{9}} - \frac{2\sqrt{3}}{1} = \frac{4\sqrt{3}}{3} - \frac{2\sqrt{3}}{1} = \frac{4\sqrt{3}}{3} - \frac{2\sqrt{3}(3)}{1(3)} = \frac{4\sqrt{3}}{3} - \frac{6\sqrt{3}}{3} = \frac{4\sqrt{3} - 6\sqrt{3}}{3} = \frac{-2\sqrt{3}}{3}$
3. $-3\sqrt{5} + \sqrt{5} = (-3+1)\sqrt{5} = -2\sqrt{5}$
4. $\sqrt{2} + \sqrt{3} + \sqrt{4} + \sqrt{1} = \sqrt{2} + \sqrt{3} + 2 + 1 = \sqrt{2} + \sqrt{3} + 3$

IX

$C = \pi d \Rightarrow 8\pi = \pi d$

$\frac{8\pi}{\pi} = \frac{\pi d}{\pi}$

$8 = d$

$\text{radius} = \left(\frac{1}{2}\right)8 = 4$

X

Check with ruler:
smaller segments should each measure 2 inches.

XI

The measure of a central angle is equal to the measure of the arc it intercepts.
$m\angle AXC = 98°$
The measure of an inscribed angle is half the measure of the arc it intercepts.
$m\angle ABC = 98° \div 2 = 49°$

XII

$L^2 + 2^2 = 5^2$

$L^2 + 4 = 25$

$L^2 = 21$

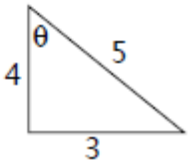
$L = \sqrt{21}$

XIII

Start by drawing a diagram.

Sine is $\frac{3}{5} = \frac{\text{opposite}}{\text{hypotenuse}}$

so we know that the hypotenuse is 5, and one leg is 3.



$L^2 + 3^2 = 5^2$

$L^2 + 9 = 25$

$L^2 = 16$

$L = 4$ so other leg is 4

$\sin\theta = \frac{3}{5}$ $\quad \csc\theta = \frac{5}{3}$

$\cos\theta = \frac{4}{5}$ $\quad \sec\theta = \frac{5}{4}$

$\tan\theta = \frac{3}{4}$ $\quad \cot\theta = \frac{4}{3}$