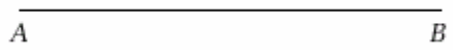
Explanation/Justification Examples

For each example, answer the bullet that the teacher asks you to complete.

Sample 1 - HSA 2000 Public Release Question [excerpt]

Use the segment below to complete the following **construction**.



Using segment $\overline{AB}$, construct equilateral triangle *ABC*.

- Use mathematics to explain the process you used to construct the triangle. Use words, symbols, or both in your explanation.
- Use mathematics to justify that the triangle you constructed is an equilateral triangle.

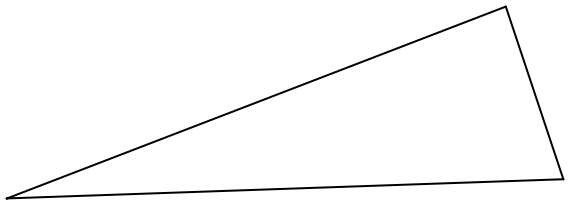
Sample 2

Draw an equilateral triangle with sides equal to 2.5 inches.

- Use mathematics to explain the process you used to draw the triangle. Use words, symbols, or both in your explanation.
- Use mathematics to justify your triangle is equilateral.

Sample 3

Helen is designing a quilt pattern. Part of the design is a triangle of one fabric with a circle of a contrasting fabric inscribed in the triangle. The triangle is shown below.

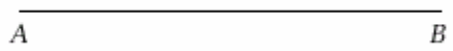


Construct the inscribed circle.

- Use mathematics to explain the process you used to draw the circle. Use words, symbols, or both in your explanation.
- Use mathematics to justify that your circle is inscribed in the triangle.

Sample 1 - HSA 2000 Public Release Question [excerpt]

Use the segment below to complete the following **construction**.



Using segment $\overline{AB}$, construct equilateral triangle *ABC*.

- Use mathematics to explain the process you used to construct the triangle. Use words, symbols, or both in your explanation.
- Use mathematics to justify that the triangle you constructed is an equilateral triangle.

An explanation could be:

With my compass I drew an arc equal to AB from points A and B. The 2 arcs intersected at point C. ΔABC is equilateral.

A justification of what they have done could be:

Since I used the same arc measure to construct $\overline{AC}$ and $\overline{BC}$, AB = AC = BC. Therefore, ΔABC is equilateral **or** *giving the measurement of each side and stating that all sides have the same measurement, therefore, ΔABC is equilateral.*

Sample 2

Draw an equilateral triangle with sides equal to 2.5 inches.

- Use mathematics to explain the process you used to draw the triangle. Use words, symbols, or both in your explanation.
- Use mathematics to justify your triangle is equilateral.

An explanation of what they have done could be:

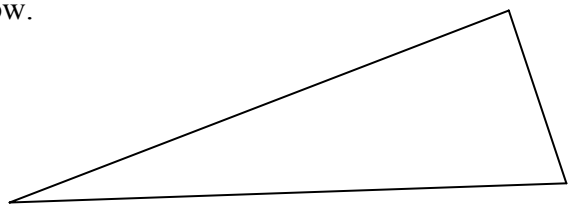
I used my ruler to draw AB = 2.5 inches. Then I used my protractor to draw angles A and B to be 60 degrees. Point C is located where the sides of angles A and B intersect.

A justification could be:

I measured each angle. They each measured 60 degrees. I measured each side. They each measured 2.5 inches. Therefore, ΔABC is equilateral.

Sample 3

Helen is designing a quilt pattern. Part of the design is a triangle of one fabric with a circle of a contrasting fabric inscribed in the triangle. The triangle is shown below.



Construct the inscribed circle.

- Use mathematics to explain the process you used to draw the circle. Use words, symbols, or both in your explanation.
- Use mathematics to justify that your circle is inscribed in the triangle.

An explanation of what they have done could be:

I constructed the angle bisectors of each angle. Their point of intersection is the center of the circle. To find the radius, I constructed the perpendicular from that center to one side. Using the center and the radius, I constructed the circle that is inscribed in the triangle.

A justification could be:

Since the point of concurrency of the angle bisectors of a triangle is the center of the inscribed circle, I constructed the angle bisectors. Since the inscribed circle is tangent to each side of the triangle, I found the perpendicular distance from the center to one side of the triangle. This gave me the radius of the inscribed circle. **Or** *The circle I constructed is tangent to all of the sides of the triangle, therefore, it is an inscribed circle.*