Explore the Area of Triangles
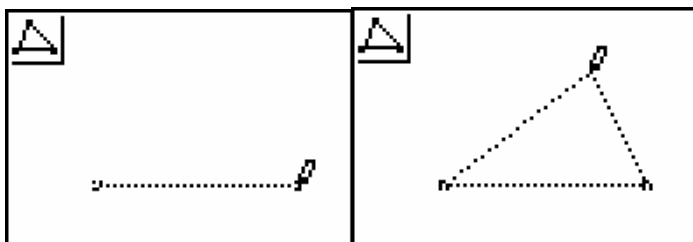
Explore the Area of Triangles Using Cabri Junior
Teacher Notes
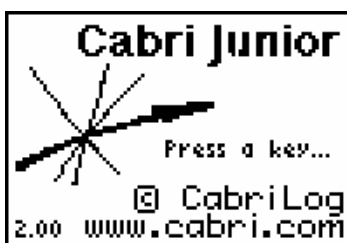
Select the F2 WINDOW key and ▼ to select a triangle.

Use the ▲ and ▼ keys to move the pencil to the lower left of the screen. Press ENTER to establish the first vertex of the triangle and ▶ until you have the first side of the triangle drawn as a horizontal line. Press ENTER to establish the second vertex.

Move the ▲ and ◀ and ENTER to establish the third vertex. Press the CLEAR key to stop drawing a triangle.

Select F5 GRAPH and use the ▲ or ▼ to select Measure. Use the ▶ and ▼ to select the Area. You should note the change in the icon in the upper left corner of the screen indicates units of area measure. The segments of the triangle will be "twinkling".

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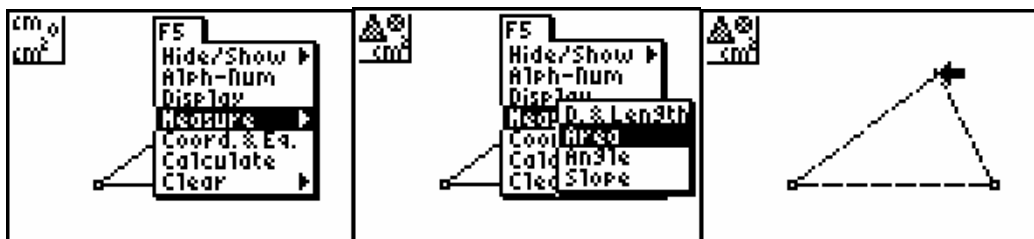
Press ENTER and the area of the triangle will appear held by the "hand". Use the ▲ and ◄ to move the area measurement above the figure.

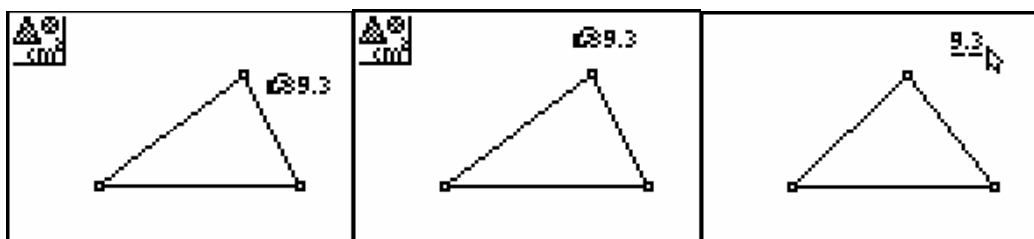When you have a location that is outside the triangle, press the CLEAR twice to end this task.

Move the pointer to the vertex at the top of the triangle (it will twinkle) and press the green ALPHA key to "grab" the top vertex.
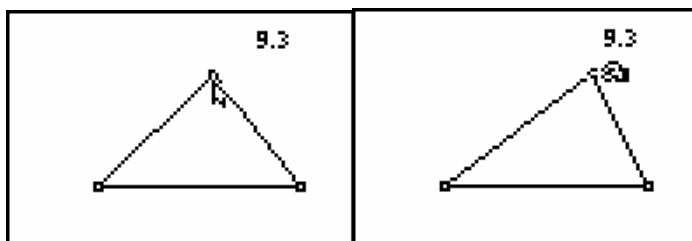
Use the ▶ and ◄ keys to move the vertex back and forth horizontally and watch what happens to the area of the triangle.

What changes and what stays the same?

Explore the Area of Triangles

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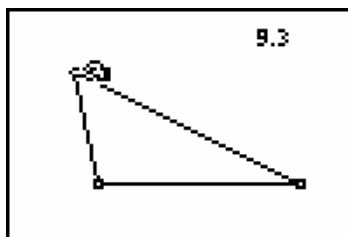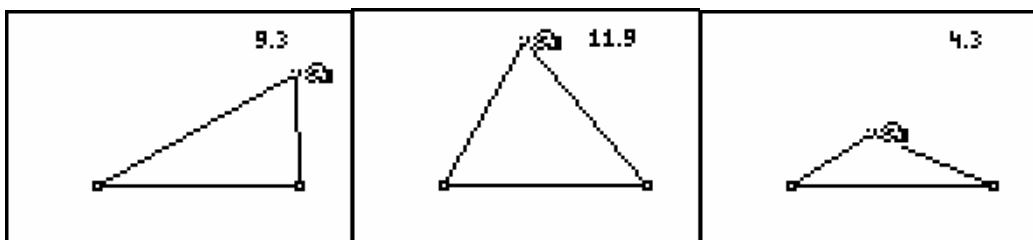Use the ▲ and ▼ keys to move the vertex vertically and watch what happens to the area of the triangle.

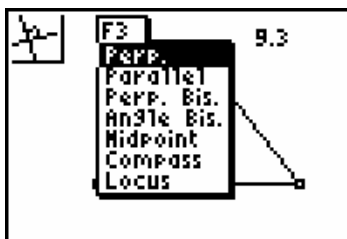What changes and what stays the same?

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_____

Explain why the area changes sometimes but not all the time when you move the top vertex.
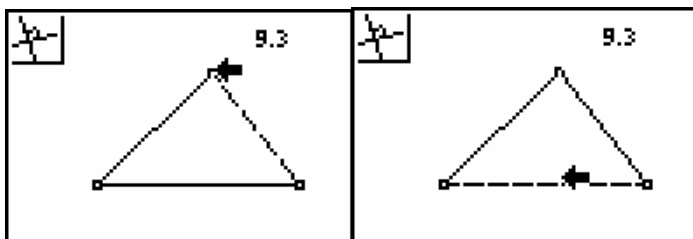
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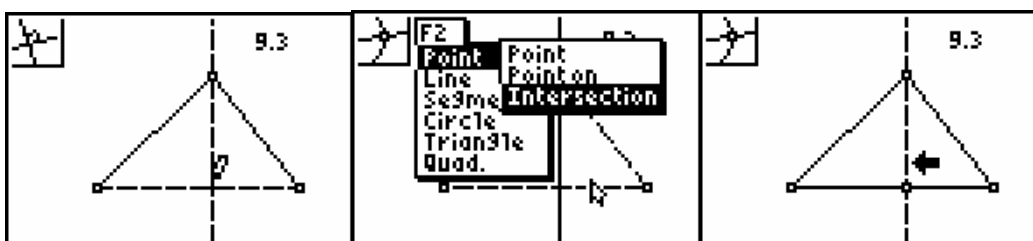## Explore the Area of Triangles

EXTENSION: Test Your Conjecture

Use the construction tool F3 ZOOM to construct an altitude or height to the base of the triangle using a perpendicular line construction.

Select the point through which the perpendicular is to go and select the base to which it is to be constructed.


Use F2 WINDOW and put the point of intersection on the base of the triangle. (Both the perpendicular line and the base segment of the triangle should twinkle before you press ENTER.)

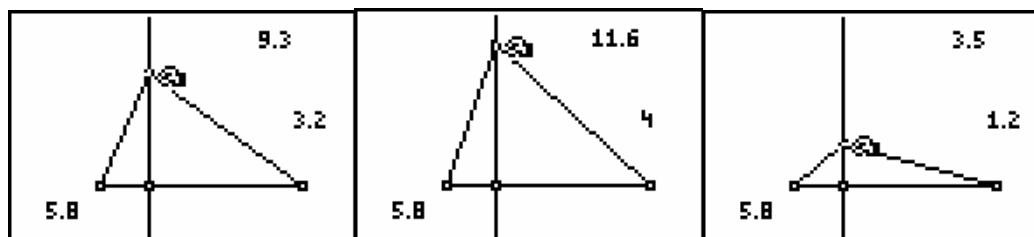Use the measurement tool in F5 GRAPH and measure the length of this altitude and the length of the base of the triangle. Be certain to highlight the endpoints of the segments to measure.

Explore the Area of Triangles
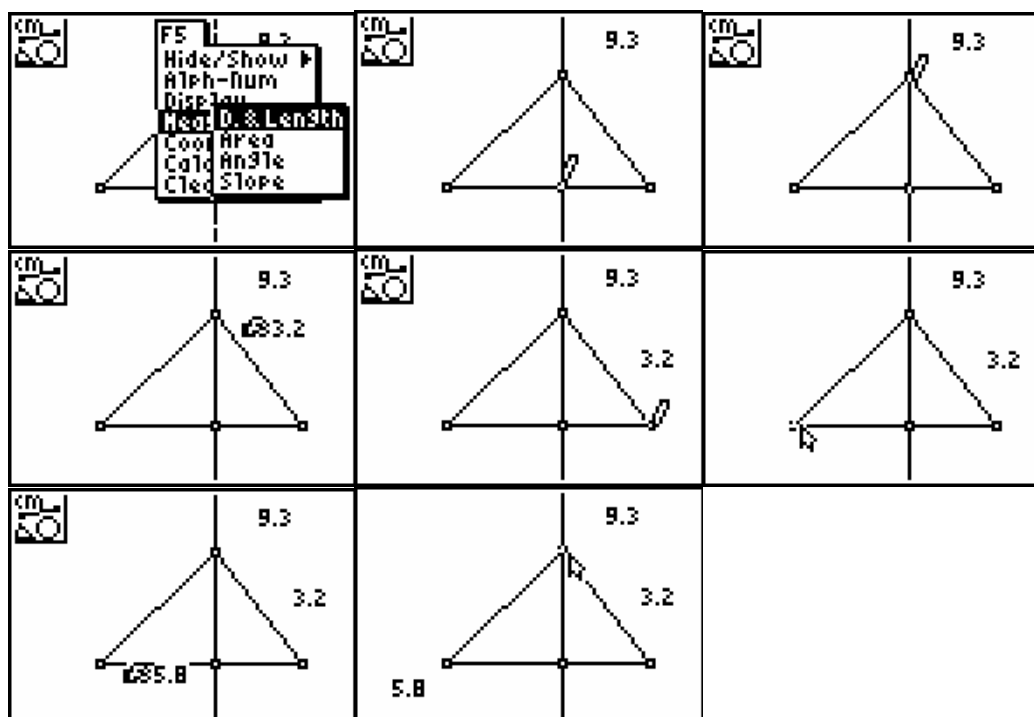
Press CLEAR.

Grab the top vertex of the triangle as in the earlier part of the exercise.

Describe what happens to the area, height and base as you move the vertex vertically and horizontally.

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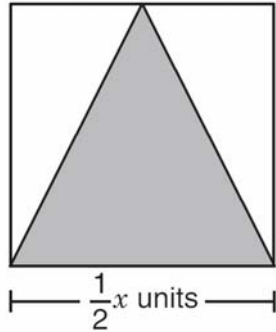Were your conclusions correct about why area changes sometimes but not always?

Did this test confirm your conjecture?

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Explore the Area of Triangles

Check for Understanding

Use what you have learned to answer the following questions.

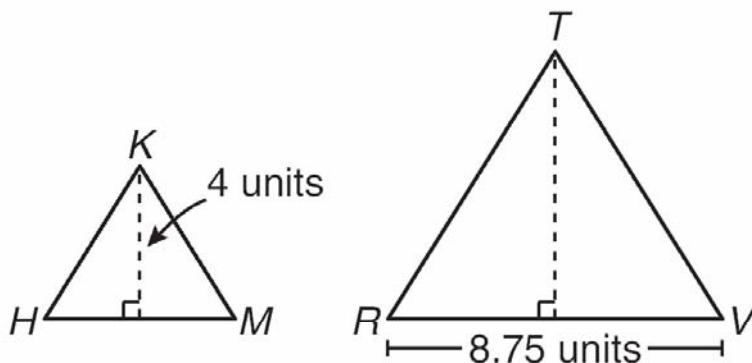**43. A triangle is inscribed in a square, as shown below.**

What is the area of the shaded triangle inscribed in the square?

A $\frac{1}{4}x^2$ units^2

B $\frac{1}{2}x^2$ units^2

C $\frac{1}{8}x^2$ units^2

D $\frac{1}{16}x^2$ units^2

Explore the Area of Triangles

51 In the figures below, $\triangle HKM \sim \triangle RTV$, and the area of $\triangle HKM$ is equal to 10 square units.

What is the area of $\triangle RTV$?

A 30.625 square units

B 87.5 square units

C 21.875 square units

D 61.25 square units