Geometric Analysis of Jaw Protrusion

The following models represent the feeding mechanism of a batoid in two different states.

 Jaws in Resting State Jaws in Protruded State

 Back Back

 

 Front

 Front

1. ABCF and DEFC are isosceles trapezoids. FC bisects angle AFE and angle BCD.

Fill in the measurement of each angle not already given.



1. Are ABCF and DEFC similar? Explain.

No. Although corresponding angles are congruent, corresponding sides are not in proportion.

1. Are △CGB and △CHD similar? Explain.

Yes. For two triangles is it sufficient to have congruent corresponding angles.

1. Find the length of the batoid feeding mechanism from front to back with the jaws in a resting state.

Answer: 1.2856 + 1.4463 = 2.7319 cm

1. JKLP and NMPL are isosceles trapezoids. Fill in the measurement of each angle not already given.



1. Find the length of the feeding mechanism from front to back with the jaws in a protruded state.

Answer: 1.8126 + 2.1143 = 3.9269 cm

1. From how far above the sea floor can the batoid reach its food?

Answer: 3.9269 – 2.7319 = 1.1950 cm or approximately 1.20 cm