

Math Skills**Algebraic Rearrangements and Features of the Ocean Floor**

Algebraic equations contain constants and variables. Constants are specific numbers, such as 2 or 5. Variables are unspecified quantities. They are unknowns.

In an algebraic equation, the total quantity on one side of the equals sign is equal to the quantity on the other side. If you perform the same operation on either side of the equation, the results will still be equal. To solve the equation, multiply or divide each side of the equation by the same factor. You can perform any operation on one side of an equation as long as you do the same thing to the other side of the equation.

SAMPLE PROBLEM:

If a continental shelf drops 0.12 m for every 100 m, how far does the shelf drop over a distance of 200 m?

SOLUTION

Step 1: Formulate an equation. Express the information you know as constants. Express the information you want to find out as a variable.

$$0.12 \text{ m}/100 = x/200$$

Step 2: Multiply each side of the equation by 100.

$$0.12 = \frac{1}{2}x$$

Step 3: Multiply each side of the equation by 2.

$$0.24 = 1x$$

The shelf drops 0.24 m over a distance of 200 m.

PRACTICE

Using the sample problem as a guide, answer the following questions. Remember to show your work.

1. On average, a continental shelf drops 0.12 m per 100 m. At 22.5 m from the shoreline, how much distance has the continental shelf dropped?

Math Skills continued

2. The deepest point of the Grand Canyon is 1.6 km. The deepest point of the Mariana Trench is 11,034 m. The Grand Canyon's deepest point is what percentage of the depth of the Mariana Trench?

3. Sound travels about 1,500 m/s through ocean water. How deep is a trench that reflects a sound wave after 6 seconds?

4. A ship takes a sonar reading over an abyssal plain. Eight seconds elapse from the time the sound waves leave the transmitter until they return to the receiver. How deep is the ocean water at this location?

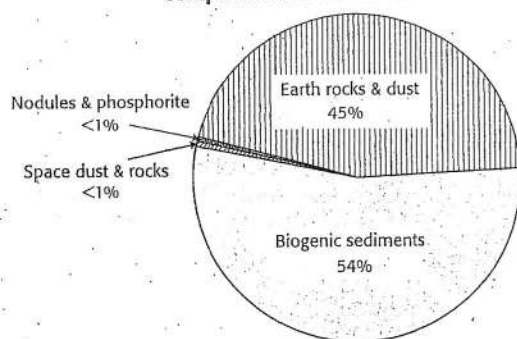
Graphing Skills

Pie Graphs

A pie graph shows how several parts make up the whole. Pie graphs are often created to show data consisting of percentages. For example, you could create a pie graph to show the percentage of each kind of sediment that is present in ocean-floor sediments as a whole.

To make a pie graph, draw a circle to represent the whole, or total. Divide the circle into 100 equal sections of 3.6° each. Or you can use a protractor to measure the number of degrees that are represented by a percentage of the circle. For example, 40% would be equal to $40 \times 3.6^\circ$, or 144° . Mark a section of the circle to represent each percentage. Then use different colors or designs to shade in each portion of the circle.

Composition of Ocean-Floor Sediments



PRACTICE

Use the pie graph above to answer the following questions.

- Which kind of sediment makes up the largest portion of ocean-floor sediments? What percentage of the total is it?

- Biogenic sediments and Earth rocks and dust together make up what percentage of total ocean-floor sediments?

Graphing Skills *continued*

- If different types of sediments were evenly dispersed on the ocean floor, how many kilograms of space dust and rocks would you expect to find in a 100 kg sample?

- The table below shows the approximate surface area of the five major oceans. Use this information to make a pie graph in the circle provided below. Make sure your pie graph has a title.

Ocean	Surface Area
Pacific	156 million km ²
Atlantic	77 million km ²
Indian	69 million km ²
Southern	20 million km ²
Arctic	14 million km ²

