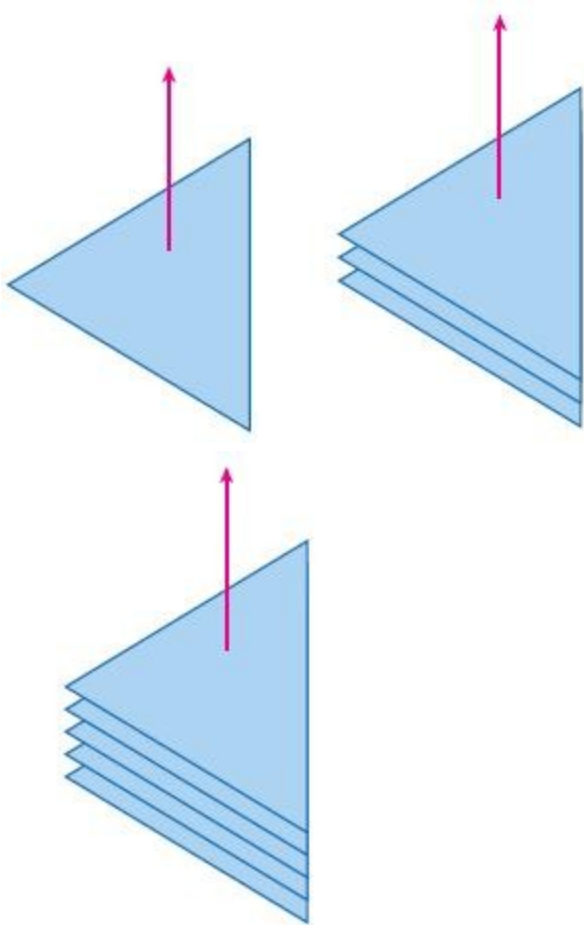## Explore 12-1 Geometry Lab: Solids Formed by Translation

1. Use congruent triangular tangram pieces to identify and sketch the solid formed by translating a horizontal triangle vertically.

   SOLUTION:
   Start with one triangular piece and stack congruent triangular pieces on top of it.

ANSWER:
right triangular prism

The solid formed by translating the horizontal triangles vertically is a right triangular prism.
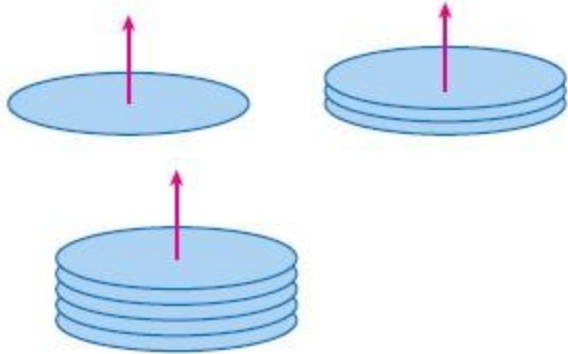
Explore 12-1 Geometry Lab: Solids Formed by Translation

2. Use the coins from a roll of quarters to identify and sketch the solid formed by translating a horizontal circle vertically.

SOLUTION:
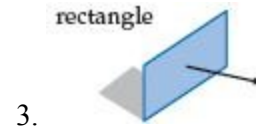The quarters will represent a vertical stack of circles as shown below.

The solid formed by translating the horizontal circle vertically is a right cylinder.
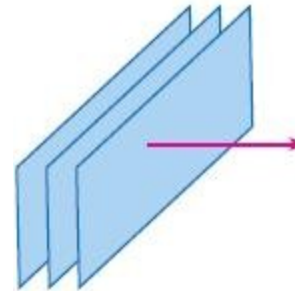

ANSWER:
right cylinder

Identify and sketch the solid formed by translating a vertical two-dimensional figure horizontally.
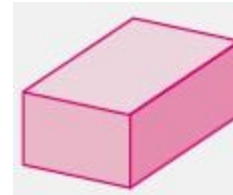
3.
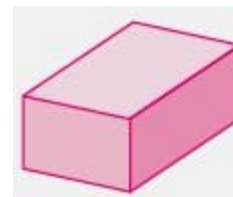

rectangle

SOLUTION:
Start by placing vertical rectangles side by side.

The solid formed by the translating of the rectangle is a right rectangular prism.
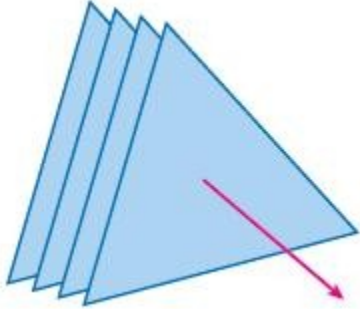

ANSWER:
right rectangular prism

triangle

4.

SOLUTION:

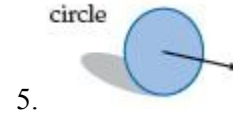Start by placing congruent vertical triangles side by side.

The solid formed by translating the vertical triangle is a right triangular prism.
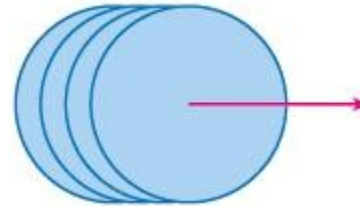
ANSWER:

right triangular prism

circle

5.

SOLUTION:

Start by placing congruent vertical circles side by side.

The solid formed by translating the vertical circle is a right cylinder.

ANSWER:

right cylinder

Explore 12-1 Geometry Lab: Solids Formed by Translation

6. **REASONING** Are the solids formed in Exercises 3, 4, and 5 right solids? Explain your reasoning.

SOLUTION:

Each figure used in Exercises 3,4, and 5 is drawn vertical to a horizontal. The solid is formed by translating the figure horizontally. Since each new figure is vertical to the horizontal, the edge formed by top and bottom of the figure will perpendicular to the vertical base figure. Therefore, the solids formed will be right solids.

ANSWER:

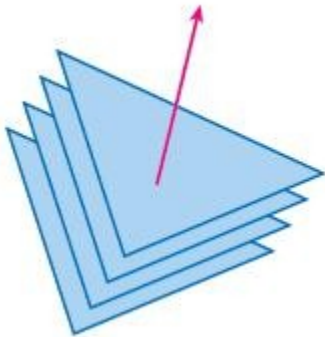Yes; the edges are perpendicular to the bases.

Identify and sketch the solid formed by translating each vertical two-dimensional figure along an oblique vector. Use concrete models if needed.
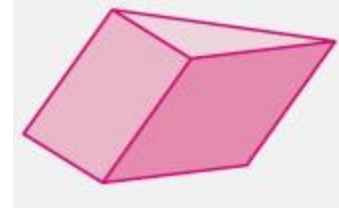
7. triangle

SOLUTION:

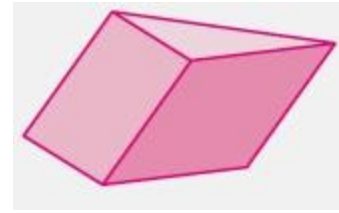Start by stacking congruent triangles on top of each other in a diagonal fashion.

The solid formed by translating the triangle along an oblique vector is an oblique triangular prism.
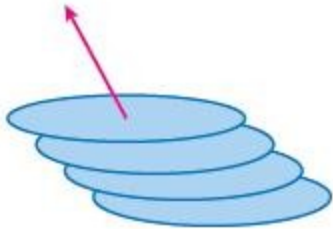
ANSWER:

oblique triangular prism

8. circle

SOLUTION:

Start by stacking congruent circles on top of each other in a diagonal fashion.

The solid figure formed by translating the circle along an oblique vector is an oblique cylinder.

ANSWER:

oblique cylinder

Identify each solid as *right*, *oblique*, or *neither*.

9.

SOLUTION:

The pyramid could be formed by stacking dilated squares along a vertical vector. That is, each successive square would be smaller than the one below it. It also appears in the diagram that the height of the pyramid is perpendicular to the base. Therefore, this appears to be a *right* solid.

ANSWER:

right

10.

SOLUTION:

The solid is a sphere. A sphere has no bases so there is no relationship between the edges connecting the bases and the base.
Therefore, the sphere is *neither* right or oblique.

ANSWER:

neither

Explore 12-1 Geometry Lab: Solids Formed by Translation

11.

SOLUTION:

It appears that this solid has been created by translating a regular pentagon along a diagonal vector. The edges connecting the bases do not appear to be perpendicular to the bases. Therefore, this solid appears to be an *oblique* pentagonal prism.
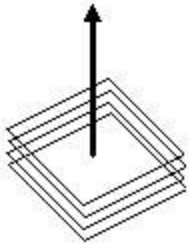
ANSWER:

oblique

12. **REASONING** Can a pyramid with a square base be formed by translating the base vertically? Explain your reasoning.

SOLUTION:

Stack congruent squares vertically.

The solid formed will be a right square-based rectangular prism. Since all the squares are congruent, the solid formed cannot be a pyramid.

ANSWER:

No; this translation would result in a square-based rectangular prism.