

**2.3**

# **Deductive Reasoning**

# Inductive Reasoning

1)

2)

3)

# Deductive Reasoning

When you make a \_\_\_\_\_ from  
things that you \_\_\_\_\_ know  
and \_\_\_\_\_.

# Given Previous Knowledge

## Softball

- If a players get three strikes, they are out
- If a player hits a ball “out of bounds”, it is foul
- If a player gets hit by a pitch, it is a “walk”

# **Situation:**

**This is Ted's first softball game. He doesn't know the rules and is wondering how to play. He sees from the stands that Joe the pitcher pitches and hits the batter. The next three people get hit with a pitch. As a result, the team scores. Ted concludes that in order to score, you must get hit by a pitch. Ted is thinking of learning how to play a different sport.**

**Inductive or Deductive?**

**Why?**

# **Situation:**

**Jeremy and Candice are playing for the local softball team. They have had a bad night and hope to win. Jeremy hits a ball out of bounds, Candice concludes that it must be a foul.**

**Inductive or Deductive?**

**Why?**

# **Situation:**

**This is Candice's night. She has been waiting to hit a homerun. On the first pitch, Candice gets hit by it. Jeremy believes that Candice will get to go to first base.**

**Inductive or Deductive?**

**Why?**

# **Situation:**

**Doug has been having a real bad night. In the first inning, he struck out. In the fourth inning, he struck out. Doug waits for the third pitch when he has two strikes. He can't take it anymore! He believes he's going to strike out again.**

**Inductive or Deductive?**

**Why?**



# LAW OF DETACHMENT

- 1) \_\_\_\_\_ is accepted as true
  - 2) \_\_\_\_\_ is indeed true
  - 3) Therefore \_\_\_\_\_ must be true
- If it rains, then soccer practice is cancelled
  - It does indeed rain

## **Example**

**If you run for office, you get Block H points**

**You do indeed run for office**

## **Example**

**If it is Friday, the next day is Saturday**

**It is Friday**

## **Example**

**If a number is odd, then it is the sum of an even and odd number**

**5 is an odd number**

# Symbolic form of the Law of Detachment

# Complete the following:

- If  $\angle A$  and  $\angle B$  are a linear pair,  
then  $m\angle A + m\angle B = 180^\circ$  .
- $\angle XYW$  and  $\angle WYZ$  are a  
linear pair.

# LAW OF CONTRAPOSITIVE

1) \_\_\_\_\_ is accepted as true

2) Given \_\_\_\_\_

3) Therefore \_\_\_\_\_

- If it is Monday, the next day is Tuesday
- Tomorrow is not Tuesday

## **Example**

**If the water is 0 degrees Celcius, the water turns into ice**

**The water has not turned to ice.**

## **Example**

**If I take a shower, I will smell good.**

**I do not smell good.**

# Symbolic form of the Law of Contrapositive



# Law of Syllogism

**If A, then B.**

**If B, then C.**

**If A, then C.**

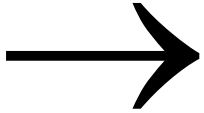
# **Law of Syllogism**

**If  $A$  is  $50^\circ$ , then it is an acute angle.**

**If it is an acute angle, it is less than  $90^\circ$ .**

# Symbols

~



⋮

∧

∨

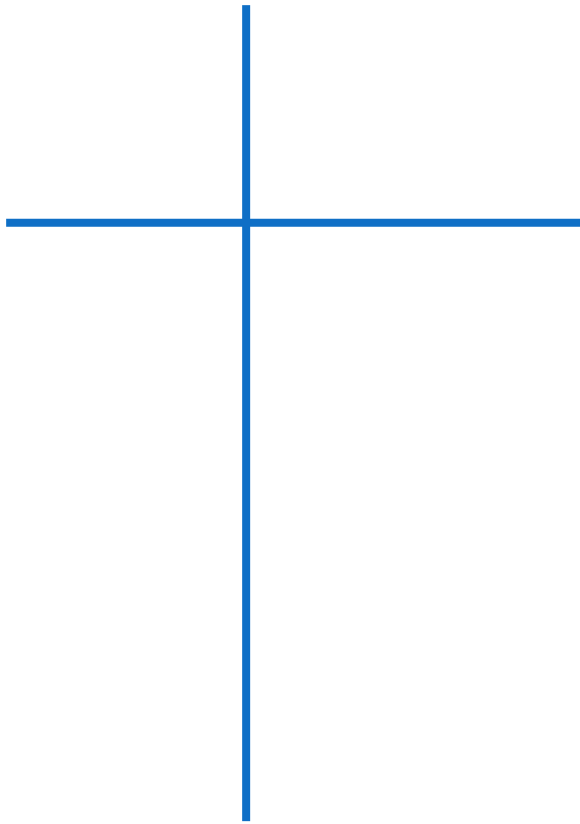
# Truth Tables

$p$  : an even number



# Truth Tables

$p$  : an even number



# **Combinations of Two**

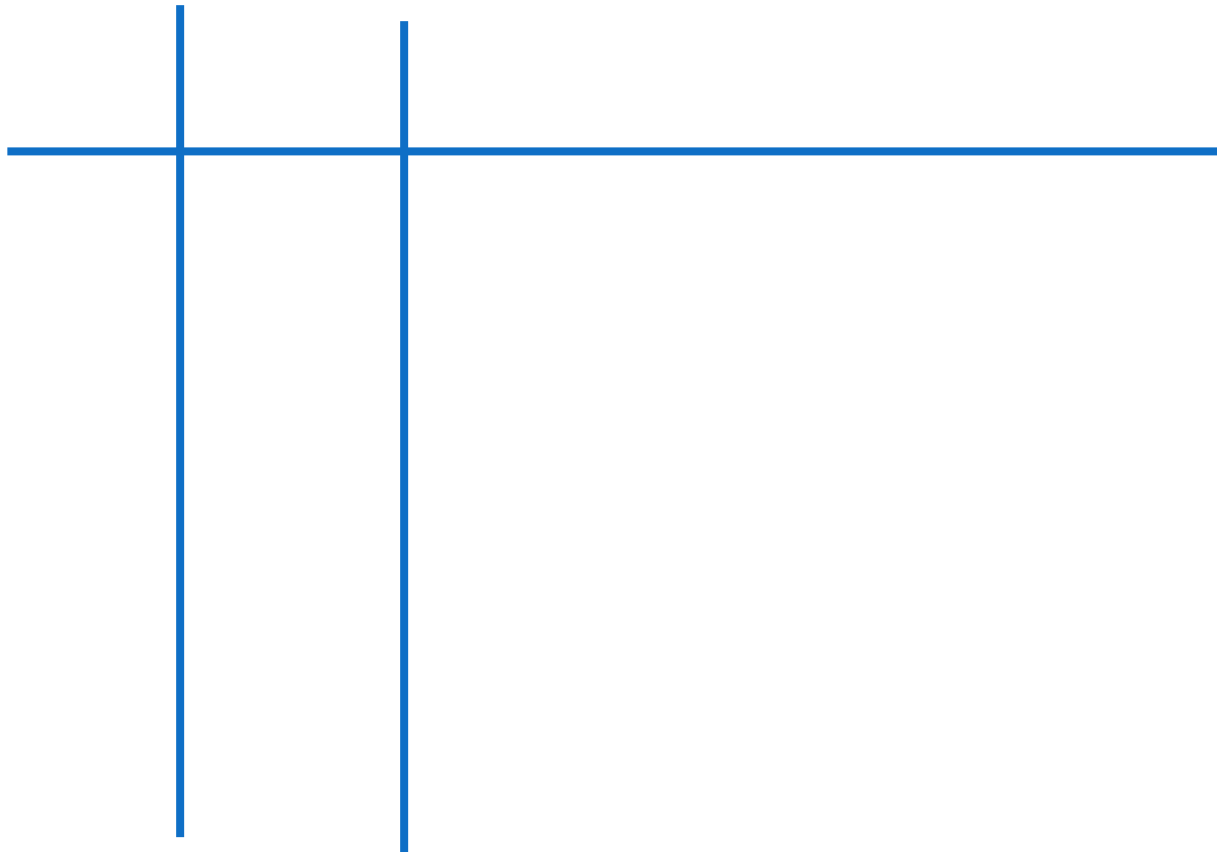
**What's the combination of heads and tails?**

# **Combinations of Two**

**What's the combination of truths and falses?**

# “And” Combination Table

In an “And” ( $\wedge$ ), it can only be true if p and q are BOTH TRUE.






# “Or” Combination Table

In an “And” ( $\vee$ ), it can only be true if either p and q (at least one) is true.

# Do You Understand?

Create a truth table for  $p \wedge \sim q$

A blank truth table grid consisting of a horizontal blue line and three vertical blue lines. The grid is intended for the student to fill in the truth values for the variables p and q, and the resulting value of the expression p ∧ ~q.

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# Do You Understand?

Create a truth table for  $\sim p \vee q$

A blank truth table grid consisting of three vertical blue lines and one horizontal blue line, forming three empty columns and one empty row.

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**2.3A**

# **SPACE GEOMETRY**

## **Objectives**

- 1. Introduce some basic solids.**
- 2. Be able to sketch the basic solids.**

# SPACE GEOMETRY

- **3-D figures**
- **Objects not restricted to flat surfaces**



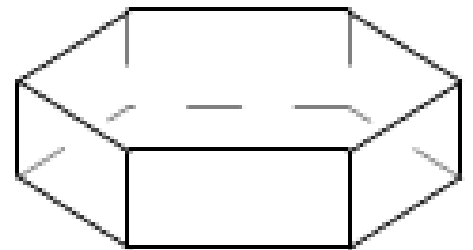
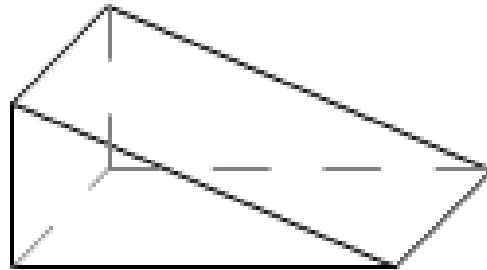
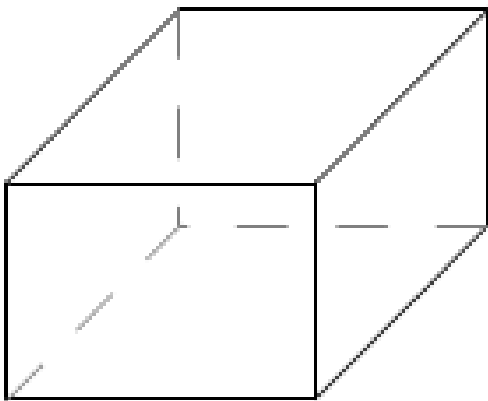
# DRAWING SPACE OBJECTS:

## Solid Lines

Lines that you see

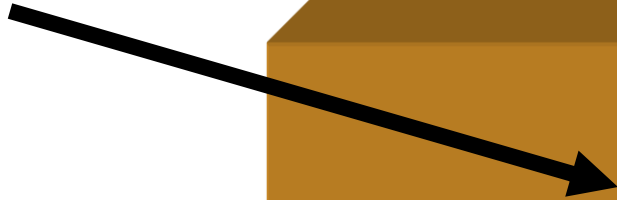
## Dashed Lines

Lines that would be visible if object was solid



# RECTANGULAR SOLID

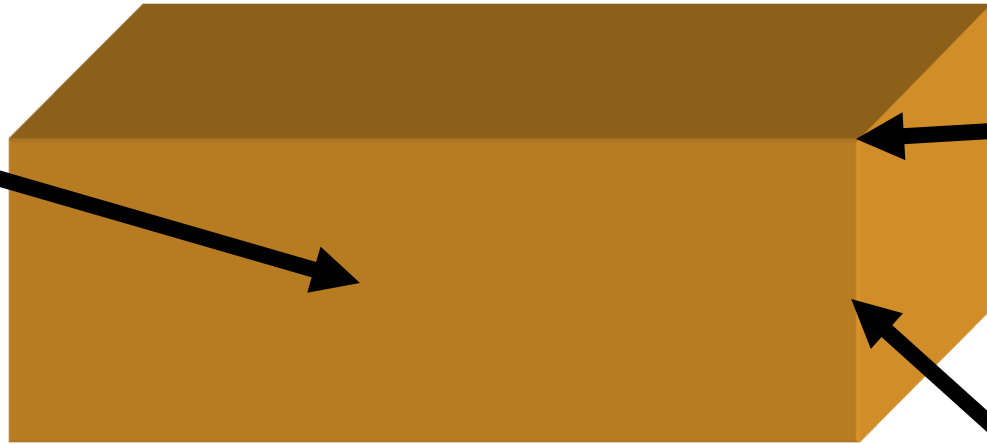
**Face**



**Vertex**



**Edge**



# **DRAWING RECTANGULAR SOLIDS**

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## **FACE-FORWARD**



# **DRAWING RECTANGULAR SOLIDS**

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## **EDGE-FORWARD**

# **DRAWING SOLIDS**

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## **CYLINDER**

# **DRAWING SOLIDS**

## **SQUARE PYRAMID**

# **DRAWING SOLIDS**

## **PENTAGONAL PYRAMID**

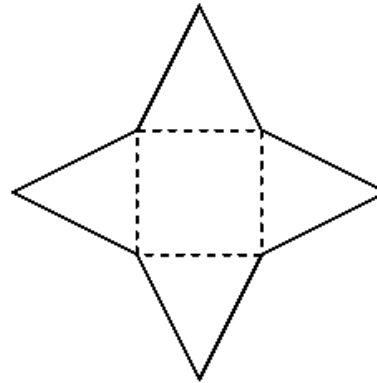
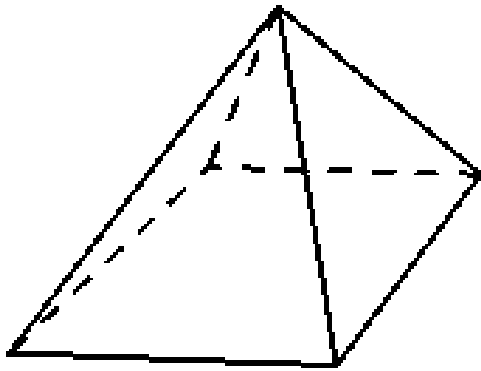
# **DRAWING SOLIDS**

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## **SPHERE**

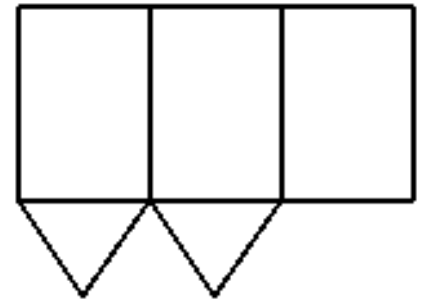
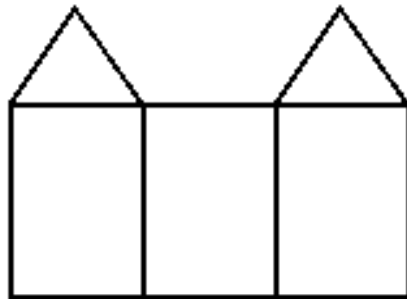
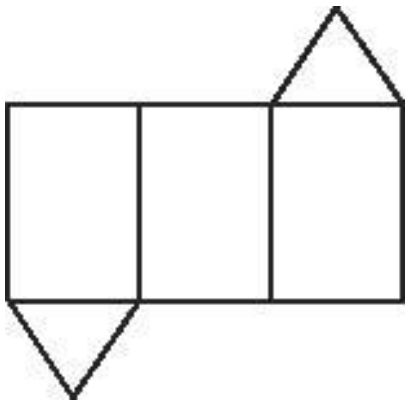
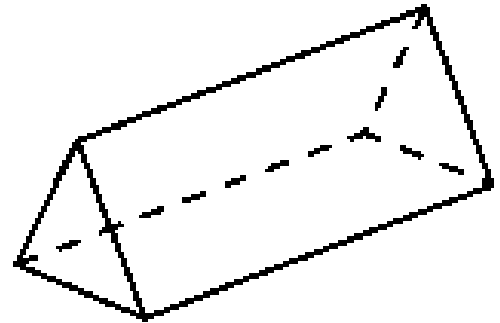
# NETS

A two-dimensional flat diagram that represents a three-dimensional figure. It shows all of the shapes that make up the faces of a solid.



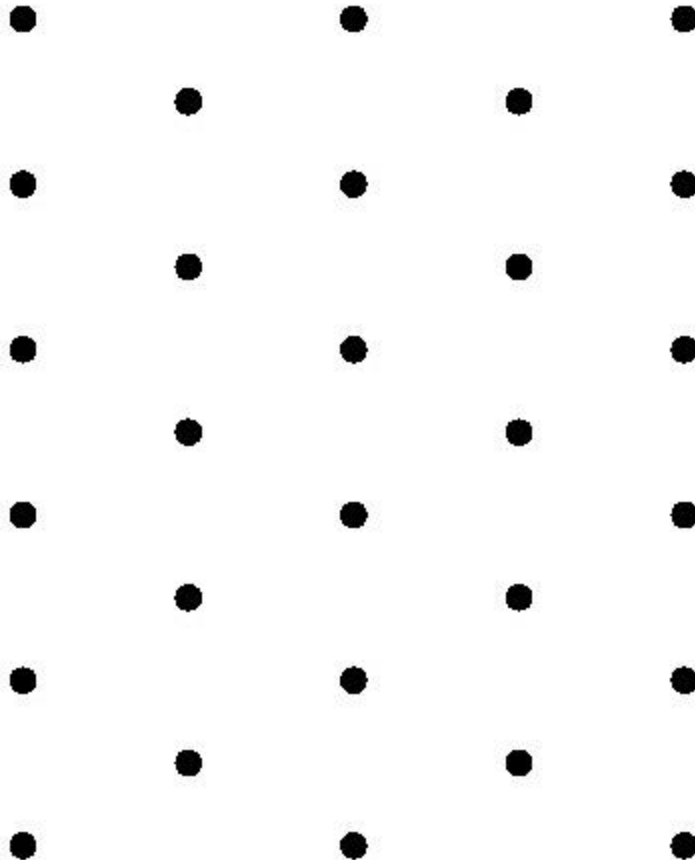
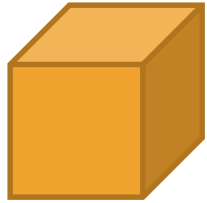
# NETS

What is a possible net for the figure shown?



# ISOMETRIC DRAWINGS

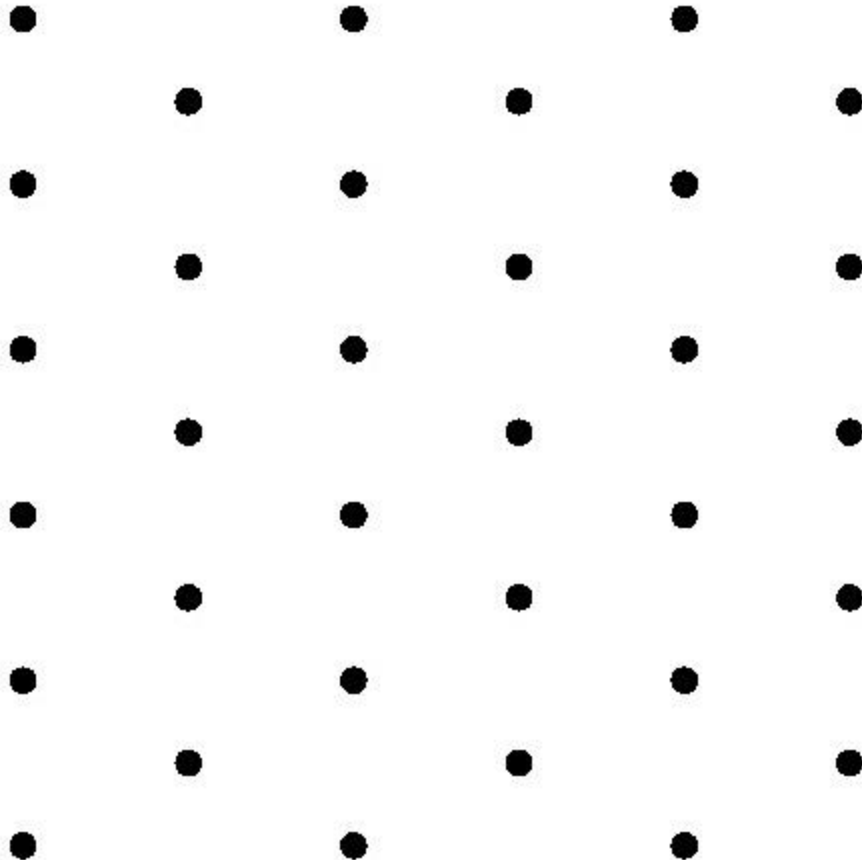
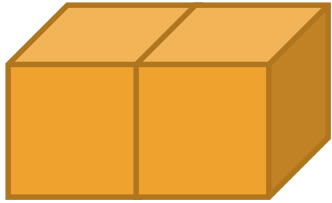
An *isometric drawing* is an edge-forward drawing of a three-dimensional figure. It shows the top, front, and side views.





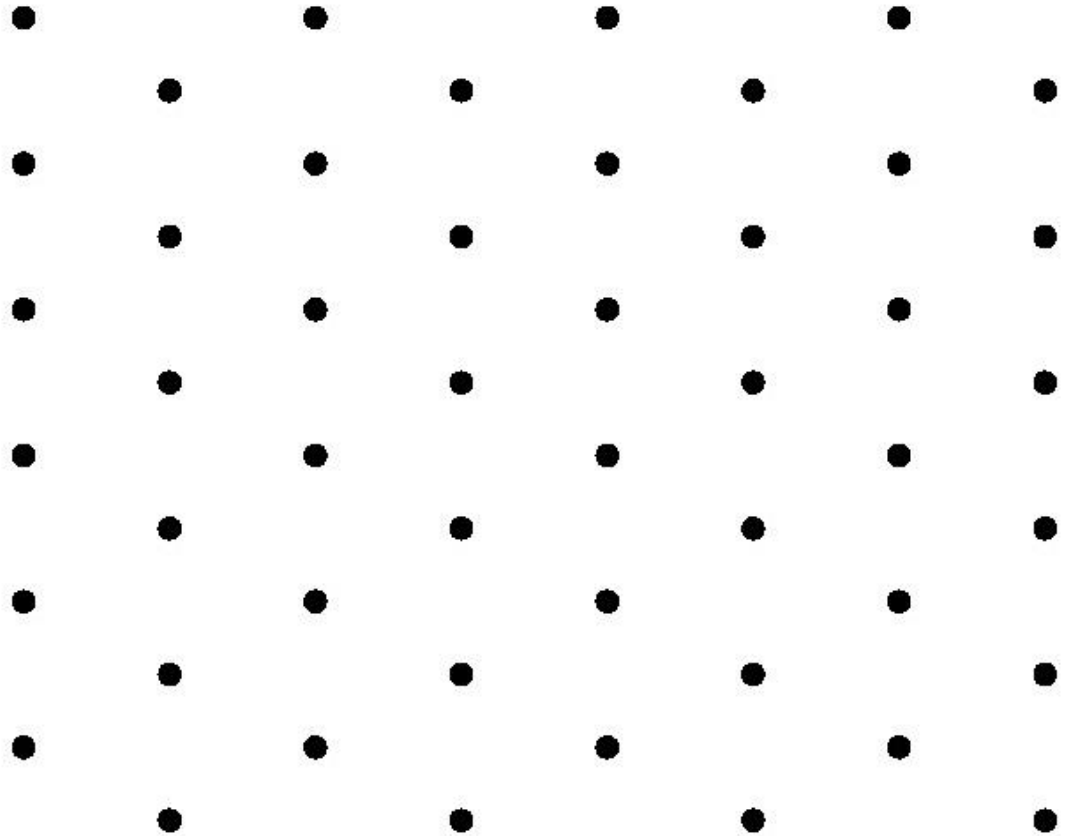
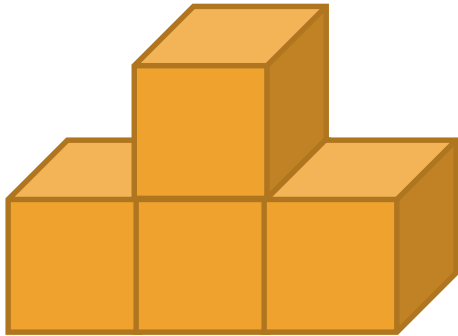
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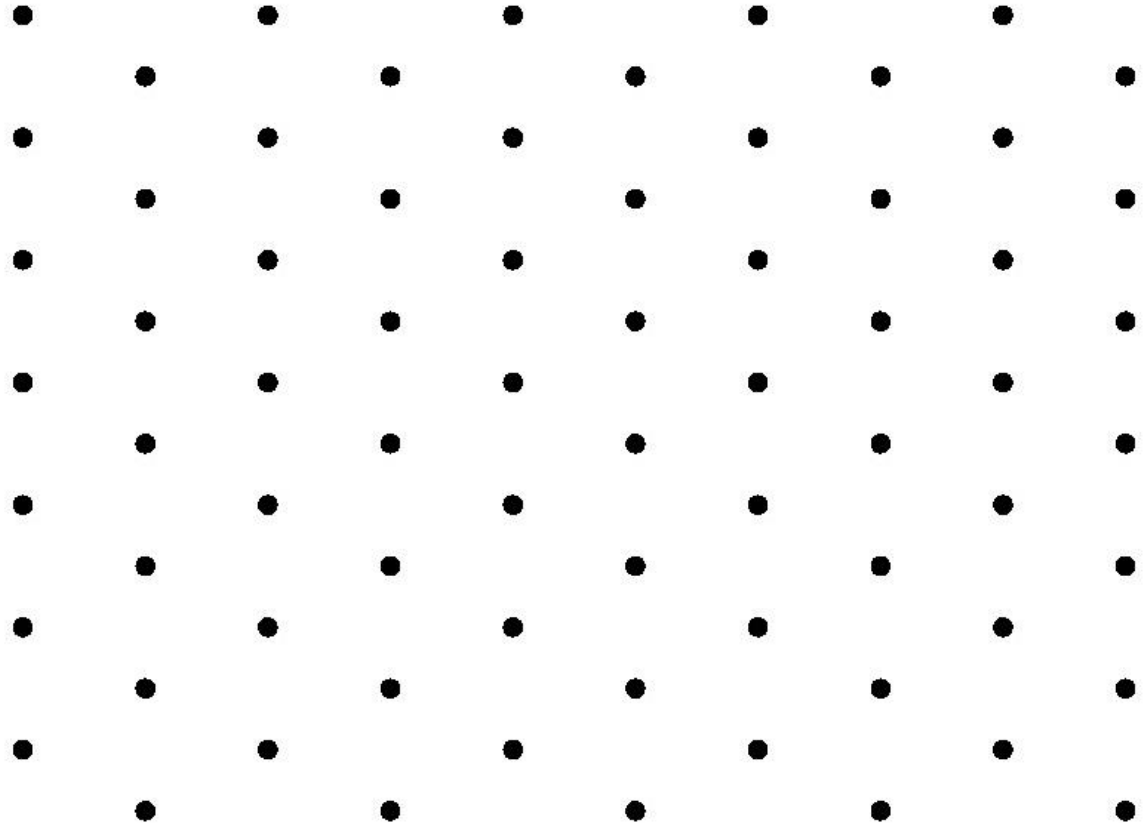
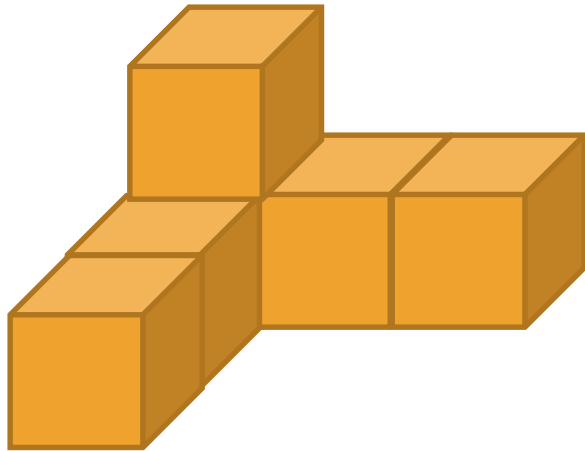
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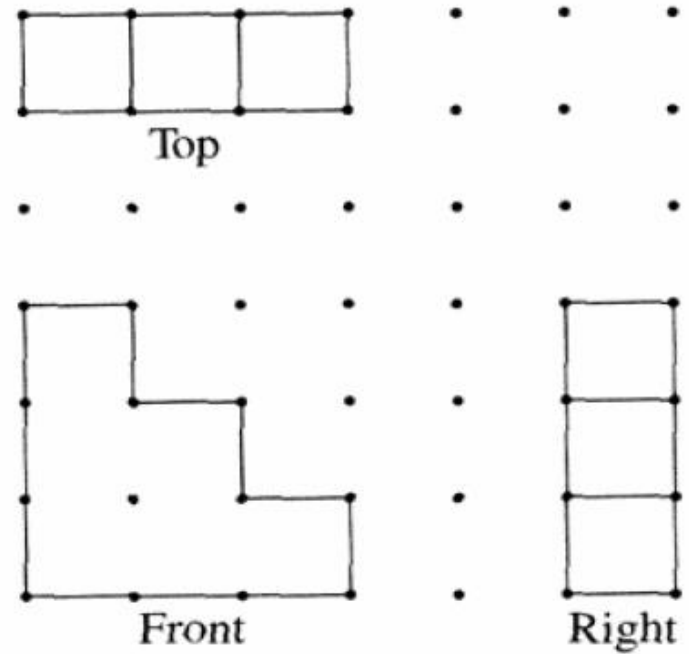
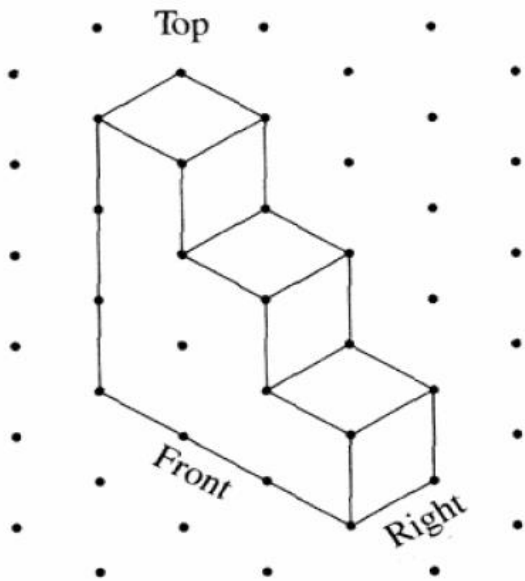
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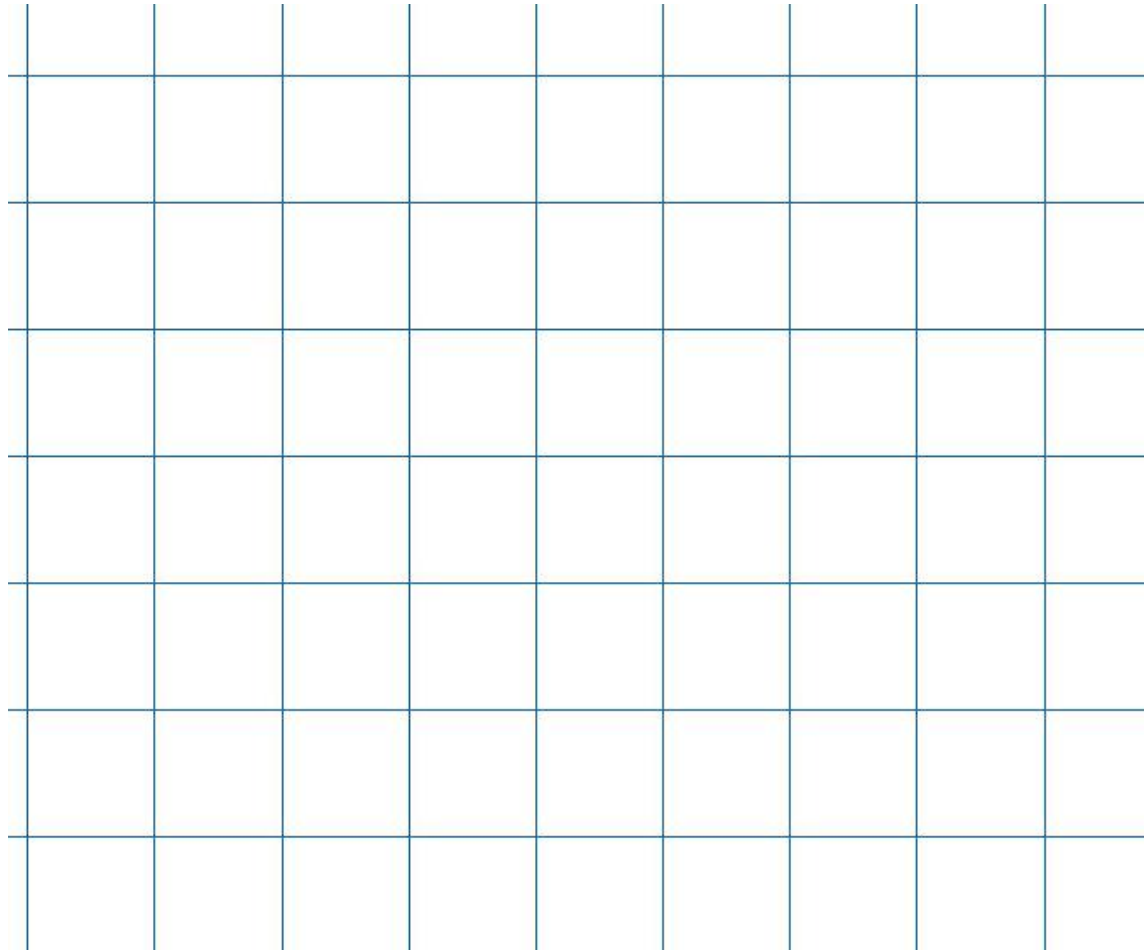
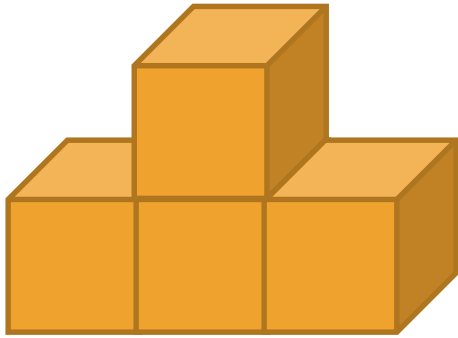
# ORTHOGRAPHIC DRAWINGS

- Shows the views of an object in 2-D
- Usually the top, front, and right side views.



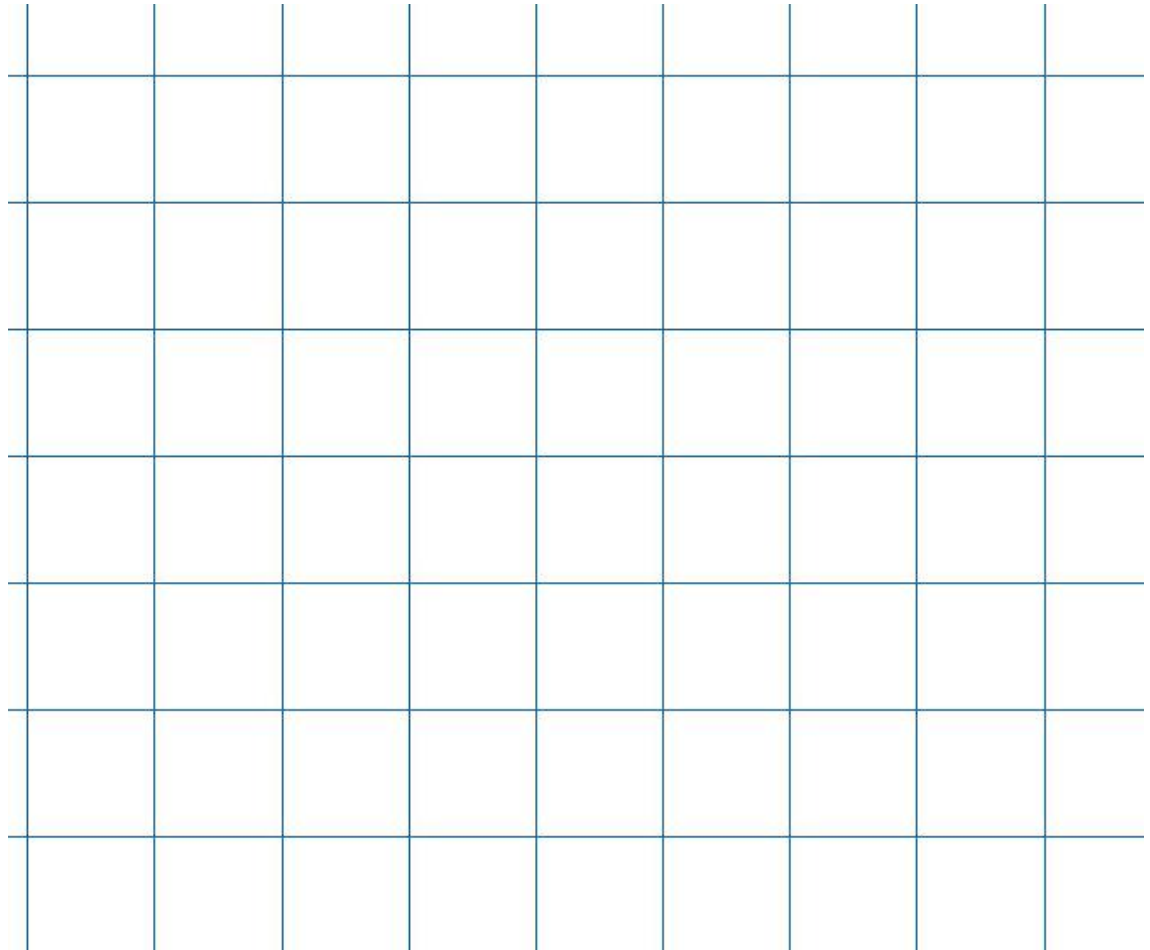
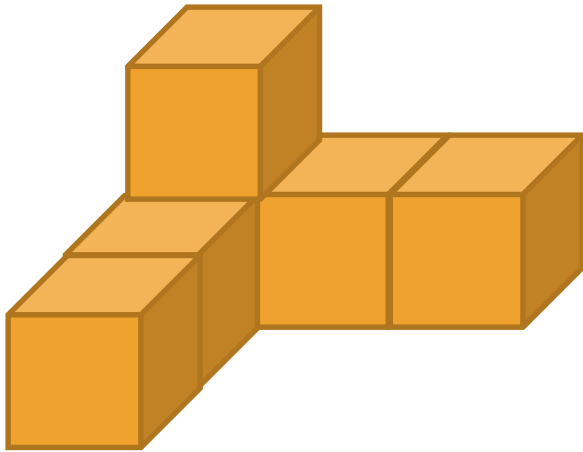
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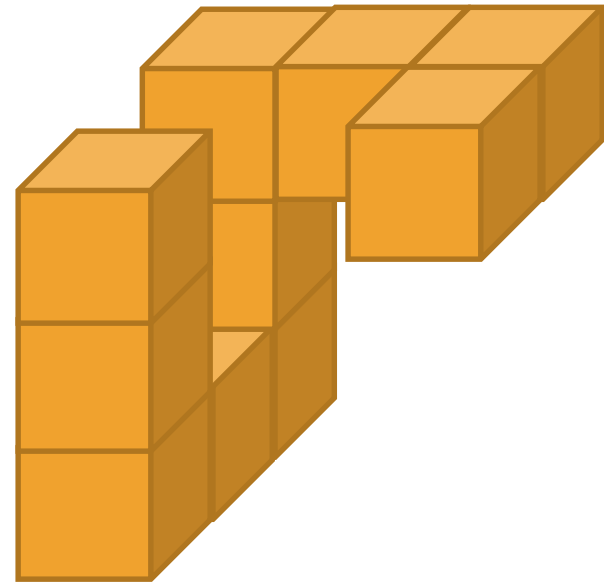
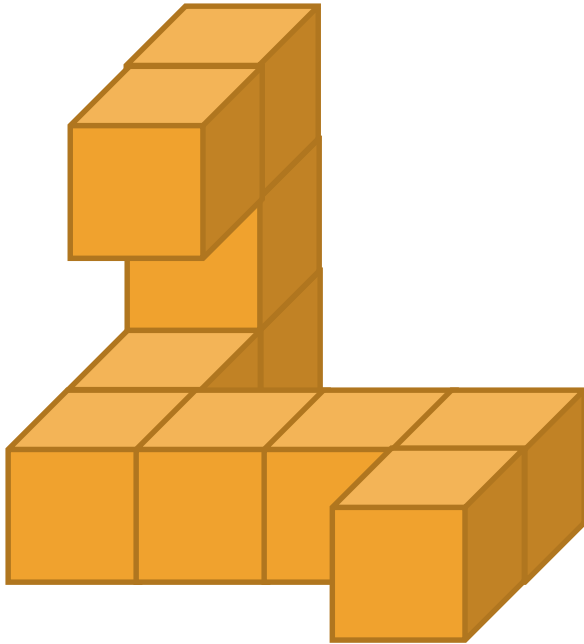
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# CHALLENGE PROBLEMS

Draw the isometric and orthographic drawings of the following.



# CHALLENGE PROBLEMS

Draw the isometric and orthographic drawings of the following.

