Part 7 Review of Graphs, Signed Numbers, Statistics, Probability, and Measurement

Unit 44 Picture Graphs

Record Sales Compared to Cassette Sales

Sales in millions of units vs. Years (1975, 1980, 1985, 1990), y-axis 0 to 600

Cassettes ⊖   Records ●

Unit 45 Signed Numbers

Number line from -5 to +5
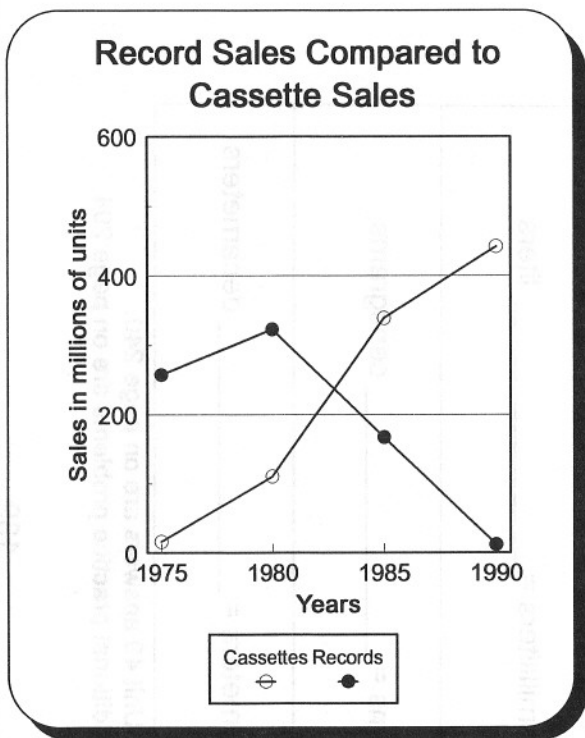
negative numbers   positive numbers
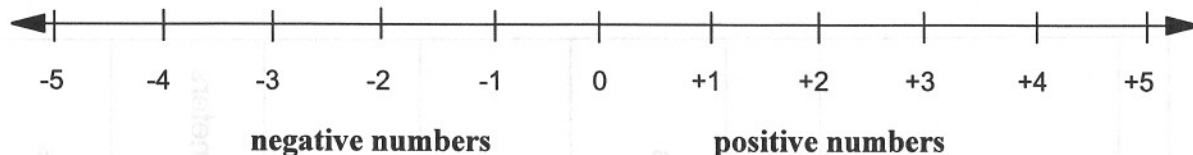
Addition of Signed Numbers

With **like signs**, add the numbers and give the answer the like sign.

$3 + 5 = 8$ $-3 + -5 = -8$

With **unlike signs**, subtract and give the answer the sign of the larger number.

$5 + (-3) = 2$ $-5 + 3 = -2$

Subtraction of Signed Numbers

Change the sign of the number being subtracted and add.

$5 - (+3) = 5 + (-3) = 2$

$5 - (-3) = 5 + (+3) = 8$

$-5 - (+3) = -5 + (-3) = -8$

$-5 - (-3) = -5 + (+3) = -2$

Absolute Value

1. The absolute value of a number is its distance from zero.

2. The symbol for absolute value is | |.

3. $|3| = 3$.

4. $|-3| = 3$.

Multiplying Signed Numbers

Rule	Example
$(+)(+) = (+)$	$(4)(5) = 20$
$(+)(-) = (-)$	$(4)(-5) = -20$
$(-)(+) = (-)$	$(-4)(5) = -20$
$(-)(-) = (+)$	$(-4)(-5) = 20$

Dividing Signed Numbers

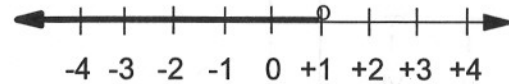| Rule	Example
$\frac{(+)}{(+)} = +$	$\frac{20}{5} = 4$
$\frac{(+)}{(-)} = -$	$\frac{20}{-5} = -4$
$\frac{(-)}{(+)} = -$	$\frac{-20}{+5} = -4$
$\frac{(-)}{(-)} = +$	$\frac{-20}{-5} = 4$

Unit 46 Coordinate Graphs

1. **This is a graph of x ≥ 2.**
   The circle over the 2 is filled in because x can equal 2.

   -4 -3 -2 -1 0 +1 +2 +3 +4
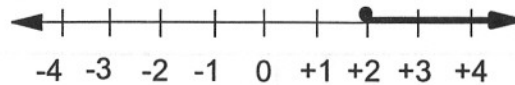
2. **This is a graph of x < 1.**
   The circle over the 1 is open because x **cannot** equal 1.

   -4 -3 -2 -1 0 +1 +2 +3 +4
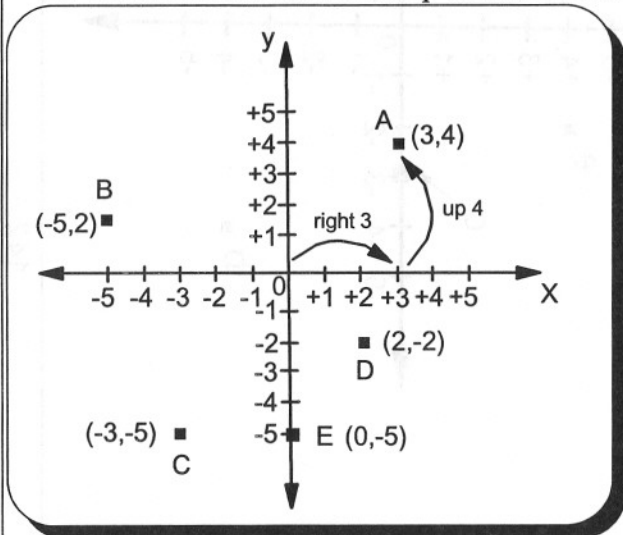
3. A **coordinate graph** contains a horizontal number line (the **x-axis**) and a vertical number line (the **y-axis**).
4. The x and y axes intersect at zero, which is called the **origin**.
5. A point on a plane (graph) is shown by (x,y).
   A. The number of units it is right or left of origin on the x-axis is x.
   B. The number of units it is up or down from origin on the y-axis is y.

6. To graph 2x + 3, create a table.

x	2x + 3 =	y
0	2(0) + 3 =	3
1	2(1) + 3 =	5
2	2(2) + 3 =	7
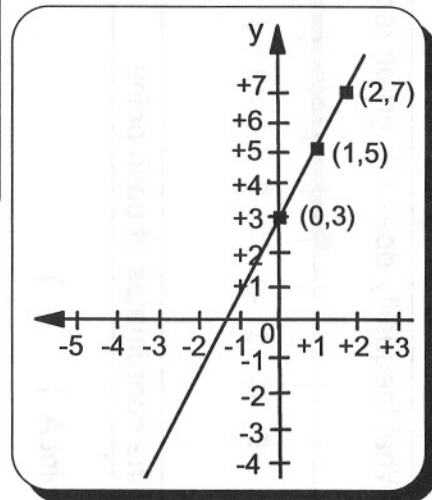
☆ The number in front of x is the **slope**. It shows the rate the line is increasing or decreasing. A line going down to the right has a negative slope.

Unit 47 Statistics and Probability

Statistics involves summarizing data.
1. The **mean** is the average.
2. The **median** is the middle number.
3. The **mode** is the number that happens most often.
4. The **range** of data is the high number - the low number.
5. **Probability** involves the chance of something happening.

This is the probability of drawing 1 jack from a 52-card deck.

$$P(\text{jacks}) = \frac{\text{Successful Events}}{\text{Total Events}} = \frac{\text{all jacks}}{\text{total cards}} = \frac{4}{52} = \frac{1}{13}$$

Unit 48 Measuring Distance, Weight, and Time

1. Addition and subtraction of everyday measures

```
   3 ft.  6 in.                 23    16 + 9 = 25
 + 4 ft.  8 in.               2̶4̶ ̶l̶b̶.  9̶ ̶o̶z̶.
   7 ft. 14 in. or 8 ft. 2 in.  - 8 lb. 12 oz.
                                15 lb. 13 oz.
```

Notes: 14 in. = 1 ft. 2 in.   borrowing 1 lb. = borrowing 16 oz.

2. Use proportions to change measures.
   Change 2.5 miles to feet.

   $$\frac{2.5\,\text{mi.}}{1\,\text{mi.}} = \frac{x\,\text{ft.}}{5,280\,\text{ft.}}$$

   $$\frac{2.5\,\text{mi.}}{1\,\text{mi.}} \diagdown\!\!\!\!\diagup \frac{x\,\text{ft.}}{5,280\,\text{ft.}}$$

   $$2.5(5,280) = x$$
   $$x = 13,200\ \text{ft.}$$

Unit 49 Using the Metric System

1. A **meter (length)** is a little longer than a yard.
2. A **gram (weight)** is much smaller than an ounce.
3. A **liter (volume)** is a little larger than a quart.

Milli = $\frac{1}{1,000}$ or .001
Centi = $\frac{1}{100}$ or .01
Deci = $\frac{1}{10}$ or .1
  1 m, g, l
Deca = 10
Hepta = 100
Kilo = 1,000

Conversion "Step" Table

↑ × 10   ↓ ÷ 10

2.5 grams = 250 centigrams

4,000 milligrams = 4 grams