Review 9   Graphs, Signed Numbers, Statistics, Probability, and Measurement
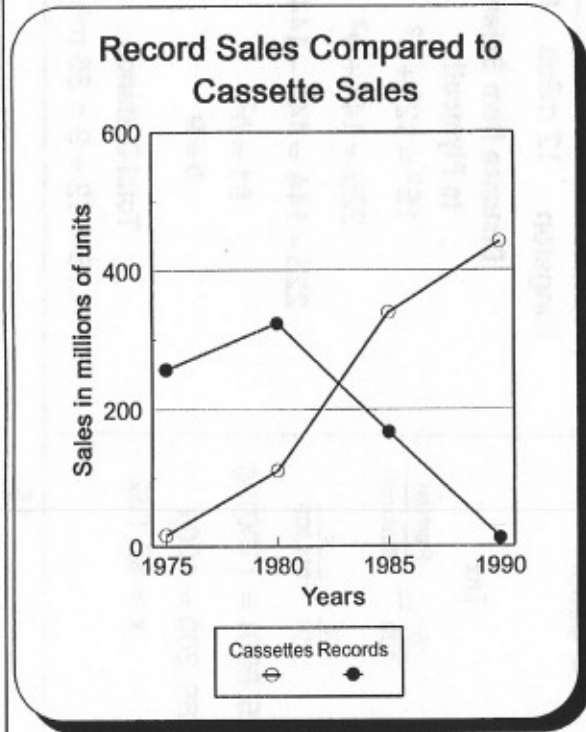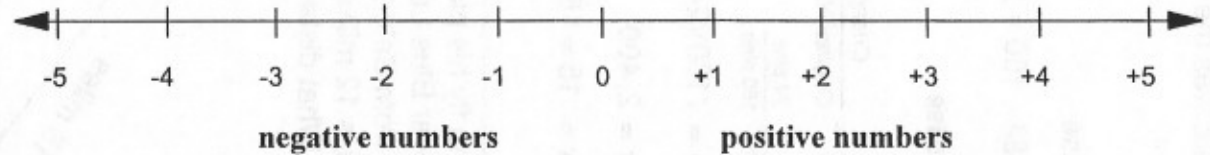
Unit 44 Picture Graphs	Unit 45 Signed Numbers

Unit 44 Picture Graphs

Record Sales Compared to Cassette Sales

Sales in millions of units / Years

Cassettes Records

Unit 45 Signed Numbers

$$-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad +1 \quad +2 \quad +3 \quad +4 \quad +5$$

negative numbers   positive numbers

Addition of Signed Numbers

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

$$3 + 5 = 8 \qquad -3 + -5 = -8$$

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

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

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
$(+)(+) = (+)$	$\rightarrow (4)(5) = 20$
$(+)(-) = (-)$	$\rightarrow (4)(-5) = -20$
$(-)(+) = (-)$	$\rightarrow (-4)(5) = -20$
$(-)(-) = (+)$	$\rightarrow (-4)(-5) = 20$

Dividing Signed Numbers

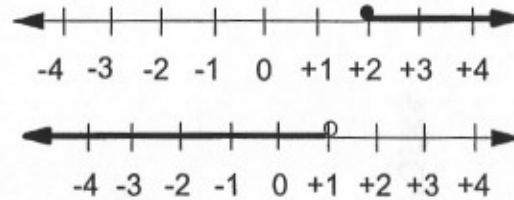| Rule	Example
$\frac{(+)}{(+)} = +$	$\rightarrow \frac{20}{5} = 4$
$\frac{(+)}{(-)} = -$	$\rightarrow \frac{20}{-5} = -4$
$\frac{(-)}{(+)} = -$	$\rightarrow \frac{-20}{+5} = -4$
$\frac{(-)}{(-)} = +$	$\rightarrow \frac{-20}{-5} = 4$

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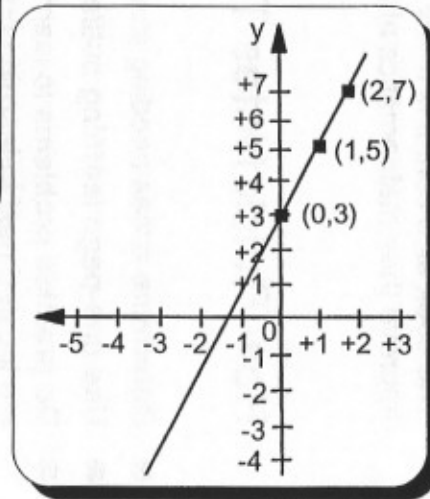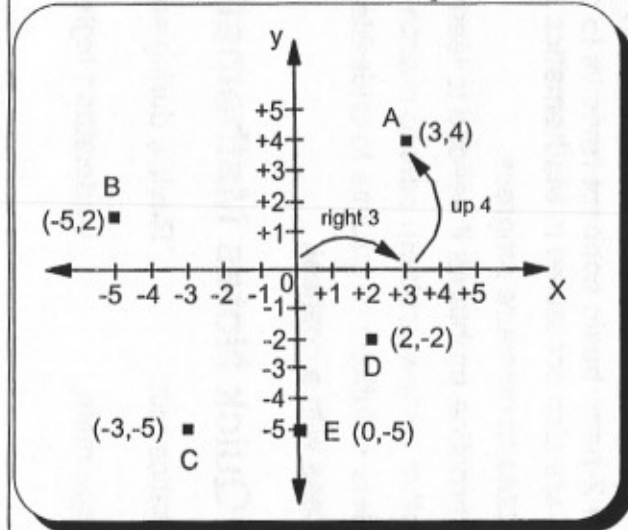
6. To graph 2x + 3, create a table.

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.

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

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 lb.  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. $\frac{2.5\ mi.}{1\ mi.} = \frac{x\ ft.}{5,280\ ft.}$
   Change 2.5 miles to feet. $\frac{2.5\ mi.}{1\ mi.} \times\!\!\!\!\times \frac{x\ ft.}{5,280\ ft.}$

   $2.5(5,280) = x$

   $x = 13,200\ ft.$

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

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