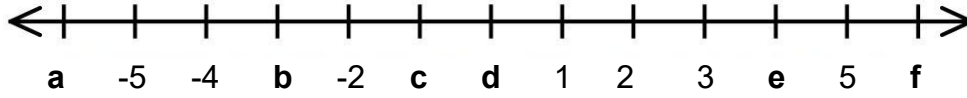


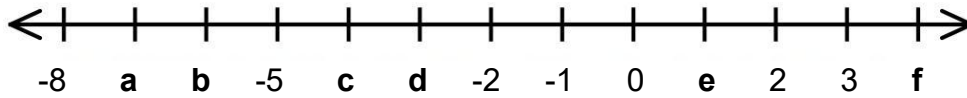
Page 66

4. Find the value of the integer that goes in each location on the number line.



- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

5. Find the value of the integer that goes in each location on the number line.



- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

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Example 3

Find each sum.

a) $5 + 7$

b) $(-3) + (-5)$

c) $6 + (-9)$

d) $4 + (-2)$

Solution

a) $5 + 7$

+++++
+++++++

$5 + 7 = 12$

b) $(-3) + (-5)$

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

c) $6 + (-9)$

+++++

Cancel out 6 of each counter.

$6 + (-9) = -3$

d) $4 + (-2)$

++++
--

Cancel out 2 of each counter.

$4 + (-2) = 2$

Let's look at the answers to example 3.

a) $5 + 7$

$5 + 7 = 12$

The answer is positive. This makes sense as we are just adding whole numbers.

b) $(-3) + (-5)$

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

The answer is negative. This makes sense as we only have negative numbers.

c) $6 + (-9)$

$6 + (-9) = -3$

d) $4 + (-2)$

$4 + (-2) = 2$

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Example 2

Evaluate each of the following expressions.

a) -3^5

b) $(-7)^2$

Solution

a) $-3^5 = -(3 \times 3 \times 3 \times 3 \times 3)$
 $= 243$

b) $(-7)^2 = (-7) \times (-7)$
 $= 49$

Page 103**Performance Task**

The table below shows temperatures at 1 pm and midnight for the first two weeks in May in the city of Chicago, Illinois.

| Day | °F at 1 PM | °F at midnight | Change (°F) |
|------------|-------------------|-----------------------|--------------------|
| May 1 | 59 | 51 | -8 |
| May 2 | 56 | 47 | -9 |
| May 3 | 52 | 45 | |
| May 4 | 57 | 42 | |
| May 5 | 54 | 45 | |
| May 6 | 54 | 50 | |
| May 7 | 65 | 48 | |
| May 8 | 69 | 46 | |
| May 9 | 85 | 57 | |
| May 10 | 92 | 70 | |
| May 11 | 91 | 77 | |
| May 12 | 95 | 76 | |
| May 13 | 93 | 71 | |
| May 14 | 85 | 68 | |

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Exercises 3.1

1. Describe the pattern in each table below.

| First Number | Second Number |
|--------------|---------------|
| 7 | 9 |
| 11 | 13 |
| 12 | 14 |
| 20 | 22 |
| 22 | 24 |

| First Number | Second Number |
|--------------|---------------|
| 13 | 11 |
| 12 | 10 |
| 8 | 6 |
| 5 | 3 |
| 2 | 0 |

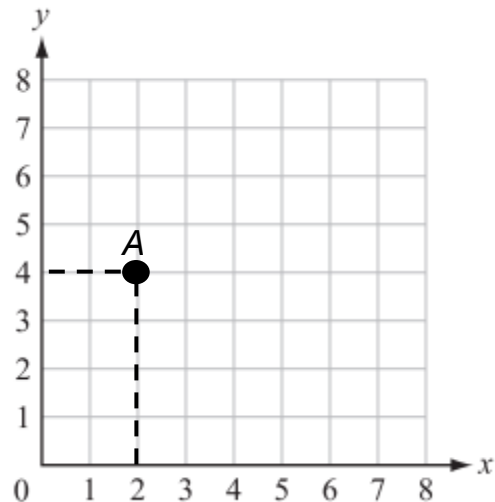
| First Number | Second Number |
|--------------|---------------|
| 2 | 6 |
| 3 | 9 |
| 7 | 21 |
| 10 | 30 |
| 30 | 90 |

Page 110

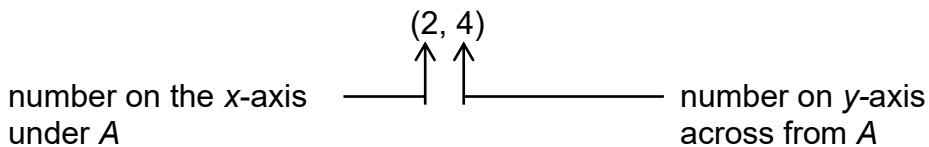
3.2 Position on a Grid

The grid at the right shows two number lines that meet at a corner. The corner is marked with a 0. The corner marked with a 0 is the starting position for describing or finding any one spot on the grid. It is called the **origin**.

As long as the starting position is known, any two numbers written in a special order can be used to show any point on that grid.



Places on the grid can be shown using numbers. The point where A is placed can be identified by two numbers.



The single point on the grid, point A, is called an **ordered pair** because that one spot can be identified by 2 numbers or a pair of numbers written in a certain order.

Example 1

Write the ordered pair for B and C shown on the grid.

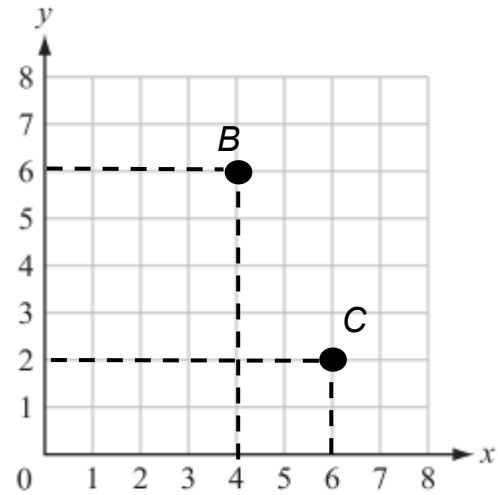
Solution

For B , the ordered pair is $(4, 6)$:

- the number under B is 4.
- the number across from B is 6.

For C , the ordered pair is $(6, 2)$:

- the number on under B is 6.
- the number across from B is 2.



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5. a) Plot each ordered pair on this grid. Join the ordered pairs in alphabetical order with lines.

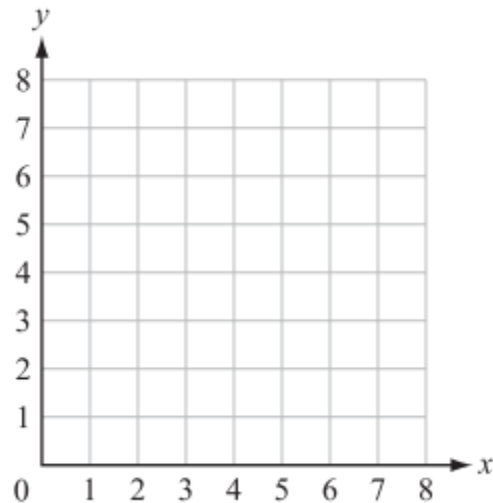
$A(1, 2)$

$B(1, 6)$

$C(5, 6)$

$D(5, 2)$

b) What shape did you draw?



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Solution 2

A pattern can be used to find the length of each side.

To find the length of each vertical side, subtract the second numbers in the ordered pairs. Start with the larger number.

$$\begin{aligned} \text{Side } AB &= 4 - (-6) \\ &= 4 + 6 \\ &= 10 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{Side } DC &= 4 - (-6) \\ &= 4 + 6 \\ &= 10 \text{ units} \end{aligned}$$

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2. The table below shows the ratio of oak trees to maple trees in the park. Fill in the missing values.

| Oak (x) | Maple (y) |
|------------|--------------|
| 5 | 3 |
| | 6 |
| 15 | 9 |
| 20 | |
| 25 | |

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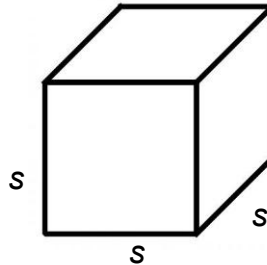
$$\begin{array}{r} 0.625 \\ 8 \overline{) 5.000} \\ \underline{- 0} \\ 50 \\ \underline{- 48} \\ 20 \\ \underline{- 16} \\ 40 \\ \underline{- 40} \\ 0 \end{array}$$

Once we have the decimal, we can write the percent as well.

$$0.625 = 62.5\% \quad \text{Multiply by 100.}$$

Page 219

The volume of this cube can be found using an expression s^3 where s is the length of one side.

**Page 229****Example 2**

Simplify by adding or subtracting like terms.

a) $5x + 2x$

b) $3y + 5y + 2y$

c) $4x - 7x$

d) $2m - 5m + 8m$

Solution

a) $5x + 2x = (5 + 2)x$
 $= 7x$

b) $3y + 5y + 2y = (3 + 5 + 2)y$
 $= 10y$

c) $4x - 7x = (4 - 7)x$
 $= -3x$

d) $2m - 5m + 8m = (2 - 5 + 8)m$
 $= 5m$

Example 3

$$\begin{aligned} \text{a) } 5x + 3 + 2x - 1 &= 5x + 2x + 3 - 1 \\ &= (5 + 2)x + 3 - 1 \\ &= 7x + 2 \end{aligned}$$

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Solution

$$\begin{aligned} \text{a) } x + 14 &= 32 \\ x + 14 - 14 &= 32 - 14 \\ x &= 18 \end{aligned}$$

Since the equation contains "+14," subtract 14 to eliminate it from the side with the x . Think of the *opposite operation*.

$$\begin{aligned} \text{d) } y - 9 &= -3 \\ y - 9 + 9 &= -3 + 9 \\ y &= 6 \end{aligned}$$

The opposite operation of "- 9" is "+ 9." Add 9 to both sides of the equation.

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10. a) Circle your answer to this expression. $6 \div 2(1 + 2)$

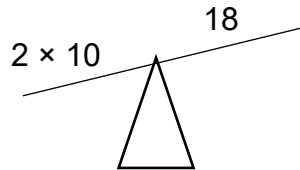
1

9

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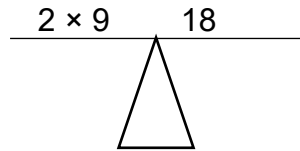
$$\text{b) } \frac{2y}{\quad} = \frac{18}{\quad}$$

Guess: $y = 10$



The scale is tilted, y cannot be 10.

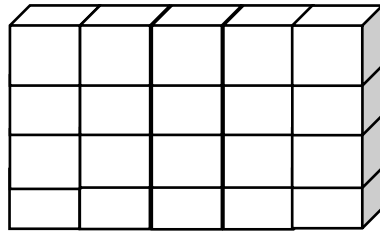
Guess: $y = 9$



The scale is level, $y = 9$.

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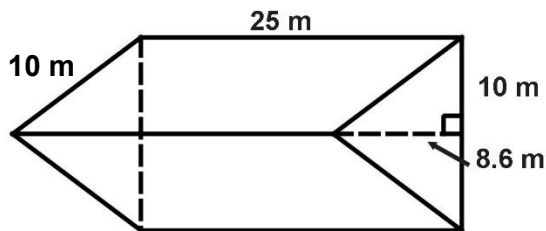
The amount of space that an object occupies is its **volume**. Volume can be measured in cubes. Look at the *rectangular prism* shown below. It is made of up of blocks.



By counting the cubes, the volume of this rectangular prism is 20 cubes. The length of the prism is 5 units, the width is 1 unit, and the height is 4 units.

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c)



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6. Brenda and 15 friends collected cans to raise money for a charity. The number of cans each collected is shown.

125, 210, 148, 125, 98, 176, 152, 194, 137, 104, 125, 149, 162, 108, 171, 202

Find the mean, median, and mode to describe the data.

Page 356

Most students have either 3 or 4 TVs at home. The line plot allows you to see:

- 14 students have either 3 or 4 TVs.
- 28 students were surveyed in total.

Page 357

The percent of students who have either 3 or 4 TVs is calculated below.

$$\frac{14}{28} \times 100 = 50\%$$

Page 360

2. Fifteen data points are written in order from smallest to largest below.

1 4 6 8 12 13 14 17 23 25 32 34 37 41 44

- a) Find the range of this data.
- b) Find the interquartile range of the data.