

11. [Integers]

Skill 11.1 Writing whole numbers in words.

MMYellow 1 1 2 2 3 3 4 4
MMRed 1 1 2 2 3 3 4 4

In a number, each digit has a special place. Generally, when writing a number in words, starting from the left, we write the word for each digit (unless it is a 0), followed by its place name.

word first!

200 = Two hundred

place next

2-digit numbers

Rule: For the numbers 21 to 99 use a hyphen (-) to separate the word for the tens from the word for the units, e.g. 67 is written as sixty-seven.

Some two-digit numbers have names that do not follow the usual rules. Use the following:

10 ten	50 fifty	90 ninety	14 fourteen	18 eighteen
20 twenty	60 sixty	11 eleven	15 fifteen	19 nineteen
30 thirty	70 seventy	12 twelve	16 sixteen	
40 forty	80 eighty	13 thirteen	17 seventeen	

3-digit numbers

Rule 1: Describe the number of hundreds first. Always write 'hundred' not 'hundreds'.

Rule 2: The word "and" is unnecessary except for the numbers between 100 and 110.

Rule 3: Don't write anything for any 0's.

4-digit numbers

Rule 1: Describe the number of thousands first. Always write 'thousand' not 'thousands'.

Rule 2: The comma is now commonly omitted in 4-digit whole numbers.

5-digit numbers

Describe the number of thousands by following the rules for 2-digit numbers.

Q. Write the number 1070 in words.

A. *One thousand seventy.*

There is 'one' thousand. There are 7 tens and 0 units so 'seventy' is written.

a) Write the number 44 in words.

forty-four

b) Write the number 87 in words.

c) Write the number 916 in words.

d) Write the number 503 in words.

e) Write the number 221 in words.

f) Write the number 2007 in words.

g) Write the number 1064 in words.

h) Write the number 9800 in words.

i) Write the number 14,700 in words.

Q. Write the largest odd, 4 digit number that includes the digits 2, 3, 5 and 6.

A. 6523

Consider the requirements one by one.
Use all 4 digits.
The largest number requires that the largest digits go first $\Rightarrow 6532$
An odd number means the last digit must not be divisible by 2.
Swap the order of the last two digits $\Rightarrow 6523$

a) What is the largest odd number less than 16?

15

b) What is the largest odd number less than 8?

c) What is the smallest even number greater than 13?

d) Write the smallest even, 3 digit number that includes the digits 2, 5 and 8.

.....

e) Write the largest odd, 3 digit number that includes the digits 1, 2 and 9.

.....

f) Write the smallest odd, 3 digit number that includes the digits 3, 5 and 9.

.....

g) Write in order from largest to smallest the odd numbers between 10 and 16.

.....
15, 13, 11

h) Write in order from smallest to largest the odd numbers between 4 and 10.

.....

i) Write in order from largest to smallest the even numbers between 7 and 15.

.....

j) Write the smallest even, 4 digit number that includes the digits 1, 3, 4 and 6.

.....

k) Write the largest odd, 4 digit number that includes the digits 2, 3, 8 and 9.

.....

l) Write the smallest odd, 4 digit number that includes the digits 5, 6, 7 and 8.

.....

Q. Complete the next two multiples of 7.

7, 14, 21, ,

A. 7, 14, 21, ,

Add 7 to the previous number.

$21 + 7 = 28$

$28 + 7 = 35$

Q. Which number is **not** a factor of 42:
3, 4 or 6?

A. **4** Divide each number into 42.

$42 \div 3 = 12$

$42 \div 4 = 10$ remainder 2

$42 \div 6 = 7$

4 does not divide evenly into 42
so 4 is not a factor of 42.

a) Complete the next two multiples of 2.

2, 4, 6, 8, 10, ,

b) Complete the next two multiples of 3.

3, 6, 9, 12, ,

c) Complete the next two multiples of 11.

11, 22, 33, ,

d) Complete the next two multiples of 8.

8, 16, 24, ,

e) Which number is a factor of 15:
3, 4 or 7?

$15 \div 3 = \dots\dots\dots$, $15 \div 4 = \dots\dots\dots$,

$15 \div 7 = \dots\dots\dots$

f) Which number is **not** a factor of 14:
2, 6 or 7?

$\dots\dots\dots$

g) Which number is **not** a factor of 18:
3, 4 or 6?

$\dots\dots\dots$

h) Which number is a factor of 25:
5, 6 or 7?

$\dots\dots\dots$

i) Which list has only factors of 35?

- A) 1, 3, 5, 35
B) 1, 5, 7, 35

j) Which list has only factors of 22?

- A) 1, 2, 4, 12,
B) 1, 2, 11, 22

k) Which list has only factors of 30?

- A) 1, 3, 5, 15
B) 1, 10, 20, 30

l) Which list has only factors of 28?

- A) 1, 4, 7, 14, 28
B) 1, 2, 3, 8, 28

Q. Which number is **not** a prime:
2, 3, 4 or 5?

A. 4

List the factors of each number.

2: 1, 2

3: 1, 3

4: 1, 2, 4

5: 1, 5

Only 4 has more factors than 1 and the number.

Q. List the composite numbers between 11 and 17.

A. 12, 14, 15, 16

Consider each number one at a time. The only prime number is 13 so all others are composite.

a) Which of the following is **not** a composite number:

4, 5 or 6?

.....
.....
5

b) Which of the following is a composite number:

2, 8 or 11?

.....
.....

c) Which of the following is a prime number:

12, 15, 16 or 19?

.....
.....

d) Which of the following is a composite number:

11, 12 or 13?

.....
.....

e) Which of the following is a prime number:

6, 7, 8 or 9?

.....
.....

f) Which of the following is **not** a prime number:

23, 27 or 29?

.....
.....

g) List the composite numbers between 2 and 7.

.....
4, 6

h) List the prime numbers between 8 and 15.

.....

i) List the composite numbers between 13 and 23.

j) List the prime numbers between 18 and 26.

Skill 11.5 Reading scales.

- Determine the value of each mark (see skill 8.3, page 37) then...

EITHER

- Start at zero and count by that amount, pointing to each mark as you go.

OR

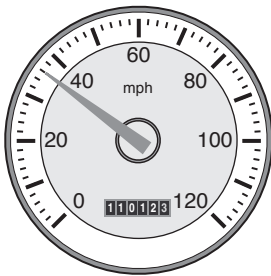
- Count on from a known point.

Q. What number is shown on the number line



A. 6 Each mark is worth 2.
Start at 0 and count by 2.
The arrow is at 6.

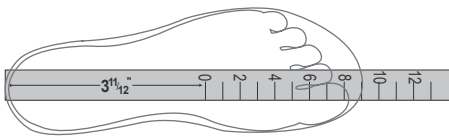
Q. At what speed is the car traveling?



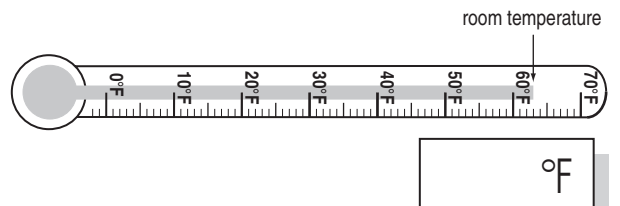
A. 36 mph

The darker calibrations mark every 10 mi but are labeled every 20 mi. The lighter calibrations show every 2 mi. The arrow is between 20 and 40 but after 30 mi. The arrow is at 3 marks after 30 mi. Counting on from 30: 32, 34 to 36.

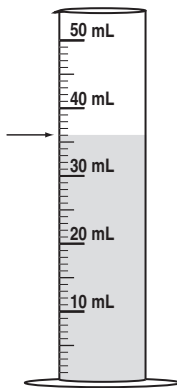
a) What shoe size is needed?



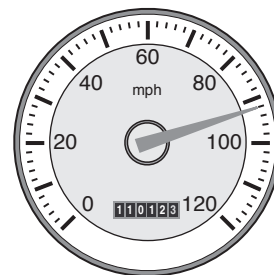
b) According to the thermometer below what is the temperature of the room?


 °F

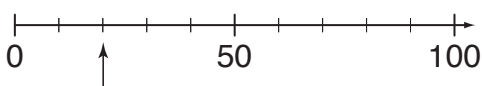
c) How much water is in the measuring cylinder?


 mL

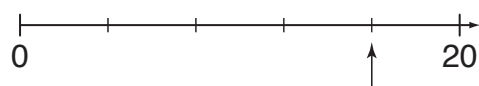
d) At what speed is the car traveling?

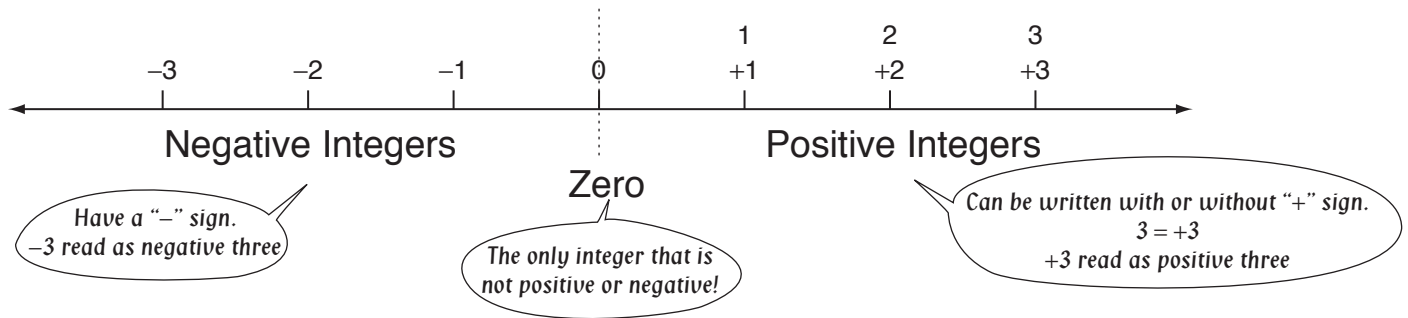

 mph

e) What number is shown on the number line?



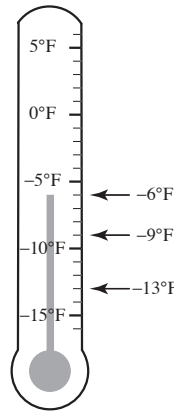
f) What number is shown on the number line?





Q. Which temperature is the highest?

- A) 9°F below zero
- B) 6°F below zero
- C) 13°F below zero



A. B

Consider each temperatures as they would appear on a thermometer.
+ means above zero
- means below zero
Hotter temperatures are higher so
-6°F or 6°F below zero is the highest of the three shown.

a) Which golf score is closest to par for the round?

- A) 4 under par
- B) 8 under par

A

b) Which scuba diver is closest to the ocean floor?

- A) 13 feet below sea level
- B) 16 feet below sea level

c) Which yard line is closest to the goal line?

- A) 8 yard line
- B) 6 yard line

d) Which elevation is the highest?

- A) 52 ft below sea level
(Lake Eyre - Australia)
- B) 282 ft below sea level
(Death Valley - USA)

e) Which temperature is the coldest?

- A) 4°F above zero
- B) 5°F below zero

f) Which year is most recent?

- A) 20 B.C. (before Christ)
- B) 8 A.D. (year of the Lord)

g) Who won the 2005 British Open?

- [Hint: The lowest score wins in golf.]
- A) F. Couples with -8
 - B) C. Montgomerie with -9
 - C) T. Woods with -14

h) In which month does the firm perform best?

- A) April: -\$200,000
- B) May: -\$220,000
- C) June: -\$202,000

Skill 11.7 Recognizing positive and negative integers.

- Consider the prepositions used with the numbers.
Positive integers would be associated with words like: above, after, deposit, over, gain, A.D.
Negative integers would be associated with words like: below, before, withdraw, under, loss, B.C.

Hint: Consider zero to be ground level. Above ground is positive. Below ground is negative.

Q. Write as a positive or negative number:
three hundred feet below sea level

A. **-300**

Write the number as digits.
Considering the preposition 'below' use a negative sign.

a) Write as a positive or negative number:
a deposit of twenty dollars

b) Write as a positive or negative number:
on the seventh floor

c) Write as a positive or negative number:
sixteen degrees below zero

d) Write as a positive or negative number:
ten seconds after take-off

e) Write as a positive or negative number:
forty-two years B.C.
(before Christ)

f) Write as a positive or negative number:
eight hundred feet above sea level

g) Write as a positive or negative number:
a score of eleven over par in golf

h) Write as a positive or negative number:
a footballer gaining four yards

i) Write as a positive or negative number:
a withdrawal of six dollars

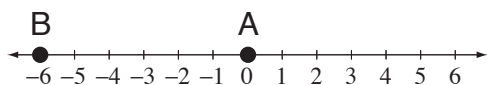
j) Write as a positive or negative number:
second floor underground

Skill 11.8 Reading integers on a number line.

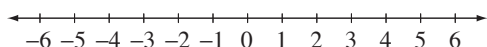
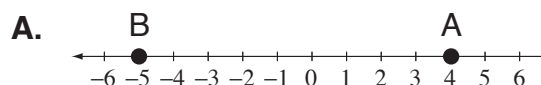
- Locate zero on the scale.
- Identify negative integers (−) or less than (<) zero and positive integers (+) or greater than (>) zero.

Q. What numbers are shown at points A and B?

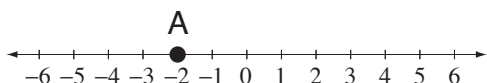
A. $A = 0$
 $B = -6$



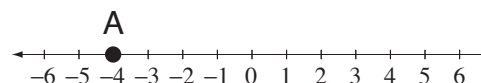
Q. Mark the following points on the number line:
A at +4 and B at −5.



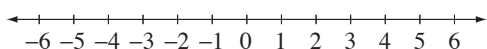
a) What number is at point A?



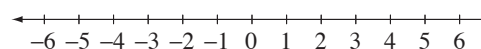
b) What number is at point A?



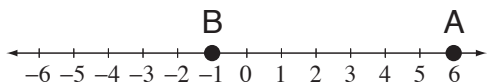
c) Mark +5 with a cross on the number line below.



d) Mark −3 with a cross on the number line below.

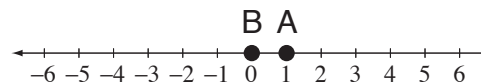


e) What numbers are shown at points A and B?



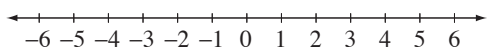
$A =$, $B =$

f) What numbers are shown at points A and B?

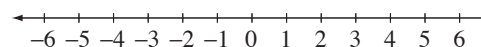


$A =$, $B =$

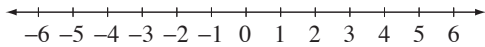
g) Mark the following points on the number line:
A at +2 and B at −4.



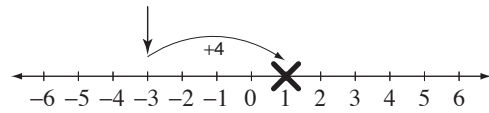
h) Mark the following points on the number line:
A at −3 and B at +3.



Q. Mark with a cross the number that is 4 to the right of -3 .



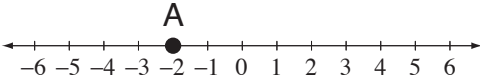
A.



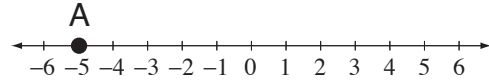
Find -3 .

Count 4 numbers to the right touching each number as you go.

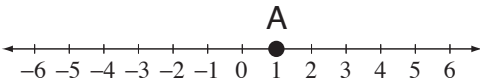
a) What number is 3 to the left of point A?



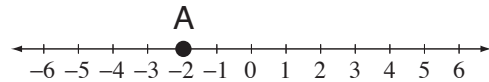
b) What number is 5 to the right of point A?



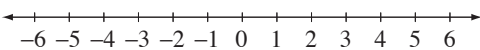
c) What number is 5 to the left of point A?



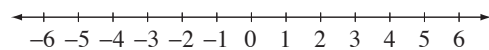
d) What number is 7 to the right of point A?



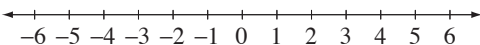
e) Mark with a cross the number that is 4 to the right of -3 .



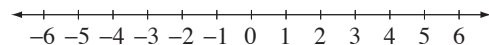
f) Mark with a cross the number that is 2 to the left of -2 .



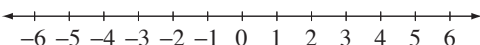
g) Start at 0. Move 1 to the right. Then move 5 to the left. At what number are you?



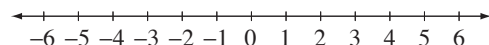
h) Start at 3. Move 2 to the right. Then move 7 to the left. At what number are you?



i) Start at -5 . Move 8 to the right. Then move 4 to the left. At what number are you?

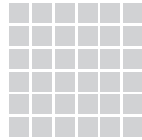


j) Start at -1 . Move 6 to the right. Then move 2 to the left. At what number are you?



Example: $6 \times 6 = 36$

$6 \times 6 =$



36
is a square number

Q. $3^2 = 3 \times 3 =$

A. 9



9 can form a square with side length 3 and so is a square number.

9 is the result of three squared (3^2) or 3×3

a) Which number is not a square number?

- A) 4 B) 8 C) 16



b) Which number is a square number?

- A) 3 B) 9 C) 12



c) $8^2 = 8 \times 8 =$

64

d) $4^2 = 4 \times 4 =$

e) $2^2 = 2 \times$

f) $1^2 = 1 \times$

g) $9^2 = 9 \times 9 =$

h) $10^2 = 10 \times 10 =$

i) $7^2 = 7 \times$

j) $6^2 = 6 \times$

k) $12^2 = 12 \times 12 =$

l) $5^2 = 5 \times 5 =$