

# Developing Conceptual Understanding of Number

## Set A: Relative Size

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# Relative Size

## Vocabulary

- number line
- interval
- represent
- corresponds
- halfway
- midway

## Notes

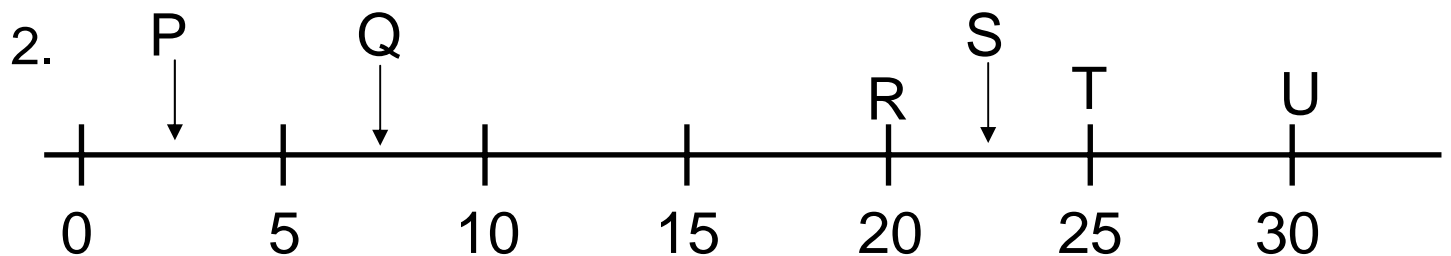
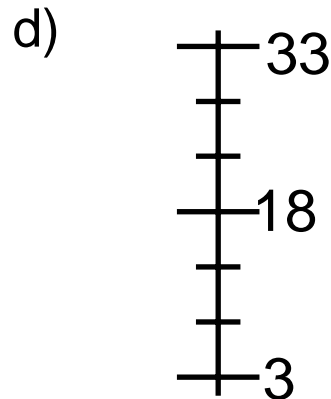
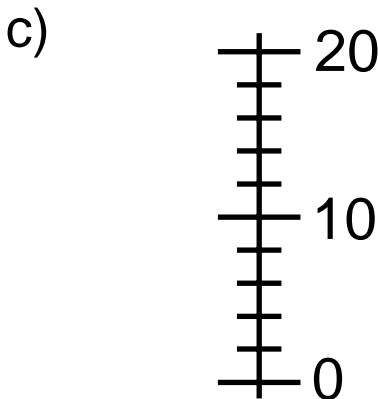
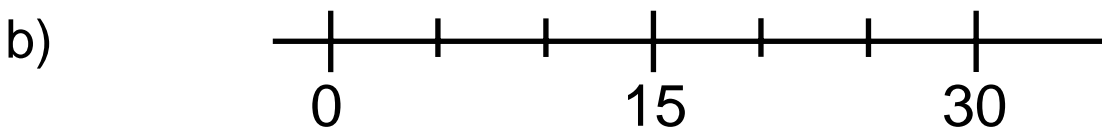
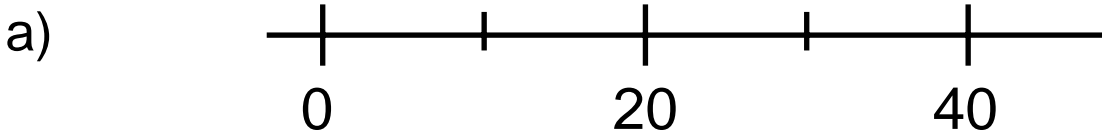
- In #1, students may respond with the value that represents the end of the first interval rather than the width of the smallest interval. In parts a), b), and c), the values are the same. But, in part d), the values are different.
- Probe for more than one way of arriving at the answers. For example, in #1, students can obtain the answer in several ways:
  - through counting or guess and check.
  - by taking a numbered interval and dividing by the number of small intervals.
  - if the number line does not start with 0, first subtract to find the width and then divide by the number of small intervals.

## Answers

1. a) 10  
b) 5  
c) 2  
d) 5
2. a) P  
b) T  
c) 22.5

# Relative Size

1. For each number line, what does the smallest interval represent?



- a) What letter corresponds to 2.5?
- b) What letter represents the number halfway between R and U?
- c) If S is midway between R and T, what number does it represent?

# Relative Size 2

## Vocabulary

- less than ( $<$ )
- between

## Notes

- Probe for more than one way of arriving at the answer. For example, in #1, students might:
  - Subtract 10 from 17 and 17 from 20 to find the smallest difference.
  - Find the number halfway between 10 and 20 and then compare 17 to that number.
- Point out the similarity between questions 4a) and 4b) to students who are having difficulty with 4b).
- Students need to go to at least the hundredths place for 4c)
- For #4, be sure the symbol " $<$ " is read as "less than" as this will come up in later sheets.
- For #4, if students are having difficulty, provide numbers and ask if the numbers belong in the box.

## Answers

1. 20
2. a) 25  
b) 10
3. a) right  
b) left
4. a) Possible Answers:  
75.1, 77, 78.99, ...  
b) Possible Answers:  
7.501, 7.51, 7.7, 7.89, ...  
c) Possible Answers:  
3.51, 3.55, 3.591, ...

## Relative Size 2

1. On a number line, is 17 closer to 10 or 20?
2. Name the number halfway between the given numbers.

a) 20, , 30

b) 7, , 13

- 
3. On a number line, is the number in the box closer to the one on the left or the one on the right?

a) 80, , 90

b) 30, , 40

- 
4. Name a number between the given numbers.

a)  $75 < \text{ } < 79$

b)  $7.5 < \text{ } < 7.9$

c)  $3.5 < \text{ } < 3.6$

# Relative Size 3

## Vocabulary

- value
- meter

## Notes

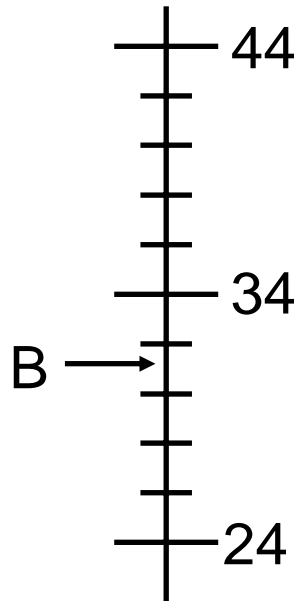
- Encourage a variety of answers.
- For these two questions, encourage students to look at the big picture before narrowing toward an exact answer.

## Answers

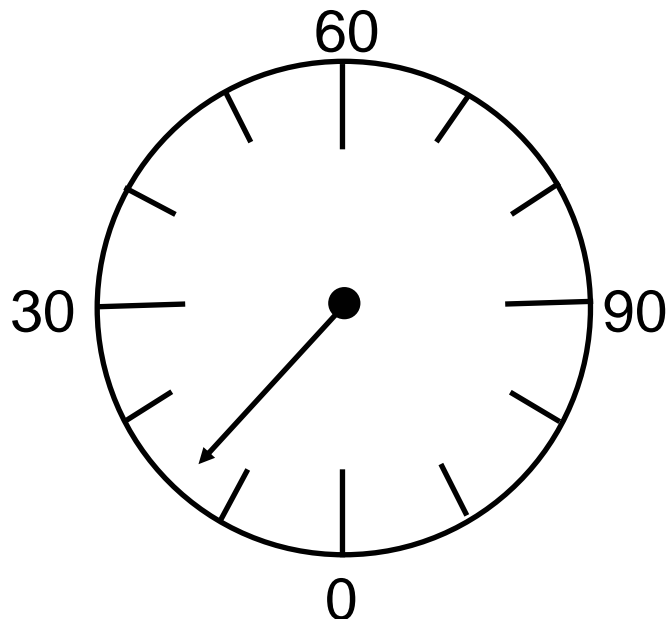
1. Possible Answers:
  - B is between 24 and 44
  - B is between 24 and 34
  - B is smaller than 34
  - B is larger than 24
  - B is between 30 and 32
  - B is closer to 32 than 30
  - ...
2. Possible Answers:
  - It is between 0 and 30 because the arrow is drawn between these two given values on the diagram.
  - It is less than 30 because the 0 is at the bottom and the 30 is the next highest recorded value.
  - It is more than 10 because each interval is 10 and the arrow is past the first one.
  - The value is closer to 10 than it is to 20 because each interval is 10 and the arrow is closer to the mark for 10 than for 20.
  - ...

## Relative Size 3

1. What do you know about the value of the number at B?



- 
2. What do you know about the value shown on the meter below? Explain.



# Relative Size 4

## Vocabulary

- greater than ( $>$ )

## Notes

- In 4a), the symbol " $>$ " appears for the first time.

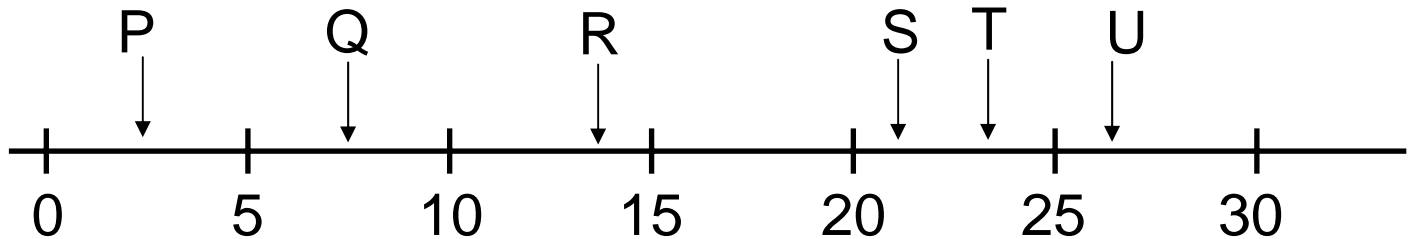
## Answers

1. 30
2. a) S  
b) Possible Answers:  
26, 26.5, 27, ...  
(between 26 and 27 inclusive)  
c) Possible Answers:  
2.5, 2.45, 2.6, ...  
(between 2 and 3 inclusive)
3. a) 10  
b) 4  
c) 20
4. a) Possible Answers:  
146.999, 145, 142.1, ...  
b) Possible Answers:  
37.41, 37.5, 38, 38.099, ...

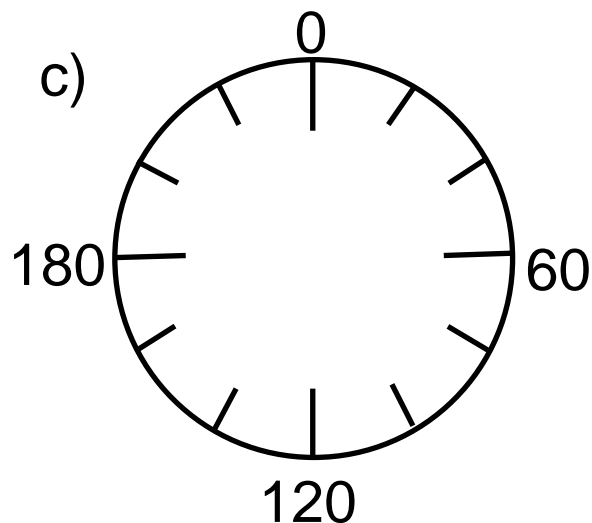
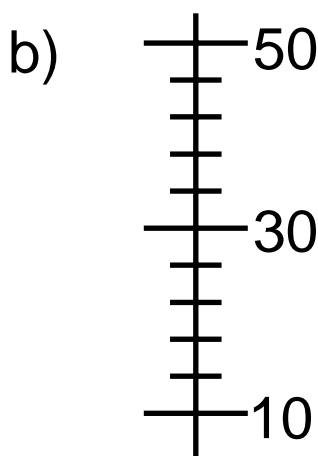
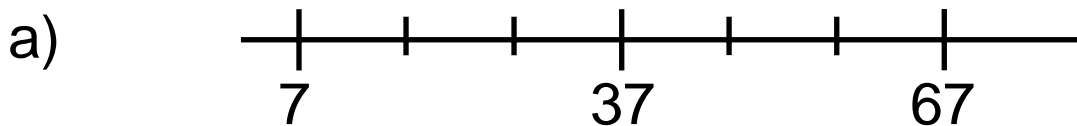


## Relative Size 4

1. On a number line, is 34 closer to 30 or 40?
2. Use the number line below to answer the following questions:



- a) What letter best corresponds to 21?
  - b) What number could be represented by the letter U?
  - c) What number could correspond to the letter P?
3. For each number line, what does the smallest interval represent?



4. Fill in the box to make a true statement.
  - a)  $147 > \square > 142$
  - b)  $37.4 < \square < 38.1$

# Relative Size 5

## Vocabulary

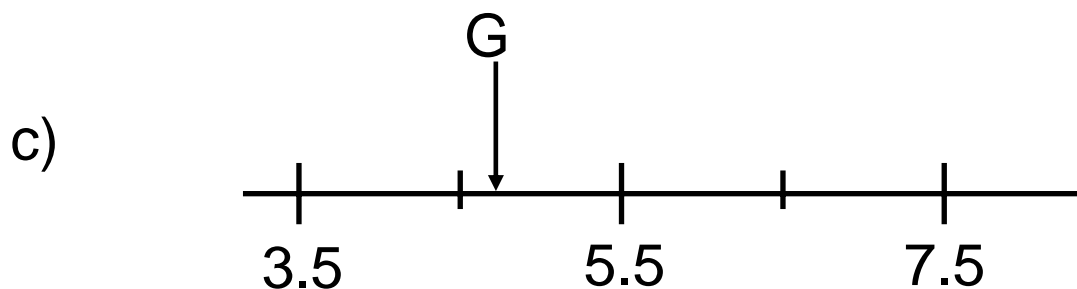
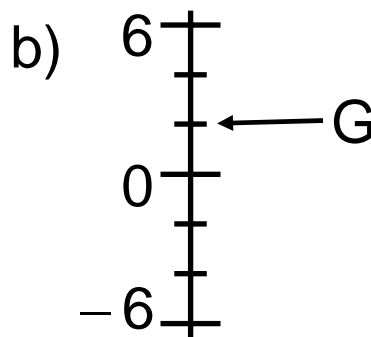
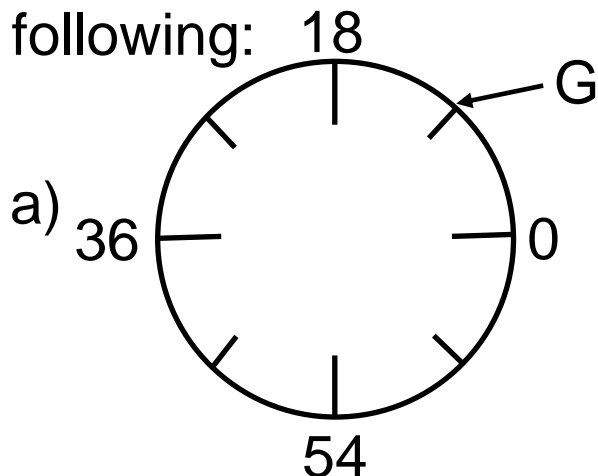
## Notes

## Answers

1.
  - a) 9
  - b) 2
  - c) Possible Answers:  
4.7, 4.75, 4.8, ...  
(between 4.7 and 4.9 inclusive)
2. 12
3.
  - a) left
  - b) right
4. Possible Answers:
  - 100 is 30 away from 70, but only 20 away from 120.
  - Halfway between 70 and 120 is 95 and 100 is larger than 95.
  - By subtraction,  $100 - 70 = 30$  and  $120 - 100 = 20$ . So, 100 is closer to 120.
  - ...

## Relative Size 5

1. State a possible value for  $G$  in each of the following:



2. Name the number halfway between 7 and 17.
3. On a number line, is the number in the box closer to the one on the left or the one on the right?

a) 6, , 11

b) 70, , 120

4. Show that your answer in 3b) is correct in two different ways

# Relative Size 6

## Vocabulary

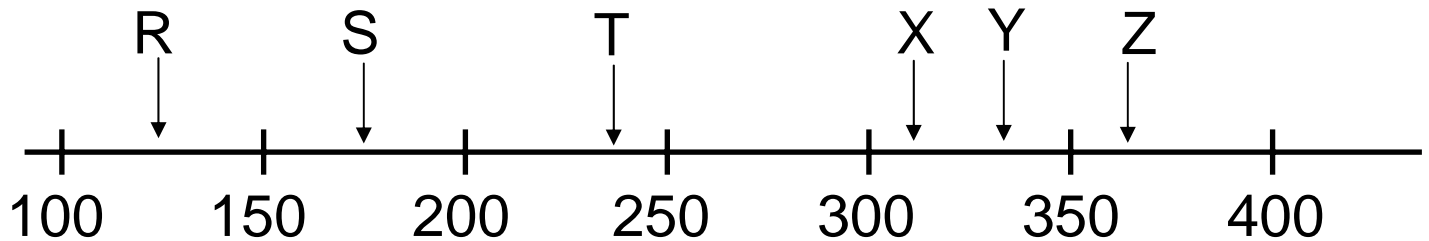
## Notes

## Answers

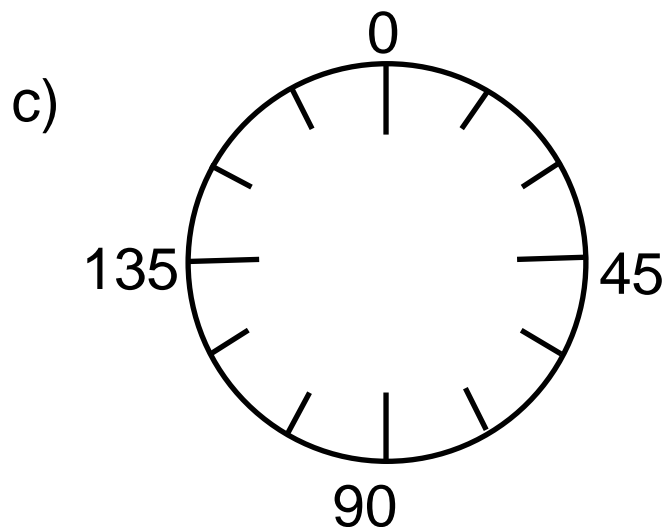
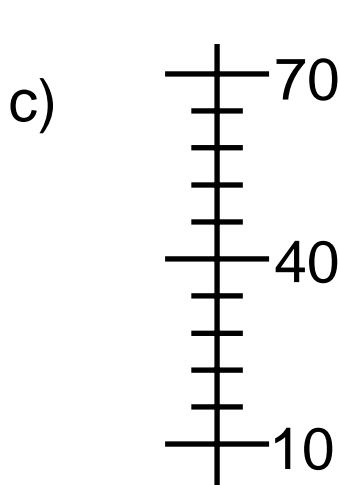
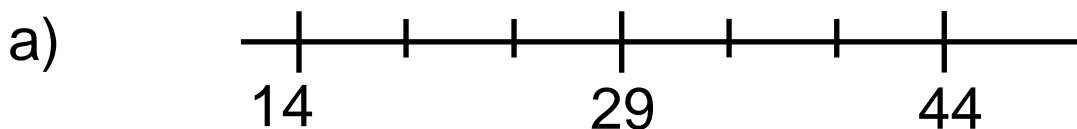
1. 3
2. a) X  
b) Possible Answers:  
360, 365, ...  
(between 360 and 370 inclusive)  
c) Possible Answers:  
125, 120, ...  
(between 120 and 130 inclusive)
3. a) 5  
b) 6  
c) 15
4. a) Possible Answers:  
14.3, 14.41, 14.523, ...  
b) Possible Answers:  
88.999, 88.25, 88.1, ...

## Relative Size 6

1. On a number line is 3.4 closer to 3 or 4?
2. Use the number line below to answer the following questions:



- d) What letter best corresponds to 310?
  - e) What number could be represented by the letter Z?
  - f) What number could correspond to the letter R?
3. For each number line, what does the smallest interval represent?



4. Fill in the box to make a true statement.
  - a)  $14.2 < \square < 14.7$
  - b)  $89 > \square > 88$

# Relative Size 7

## Vocabulary

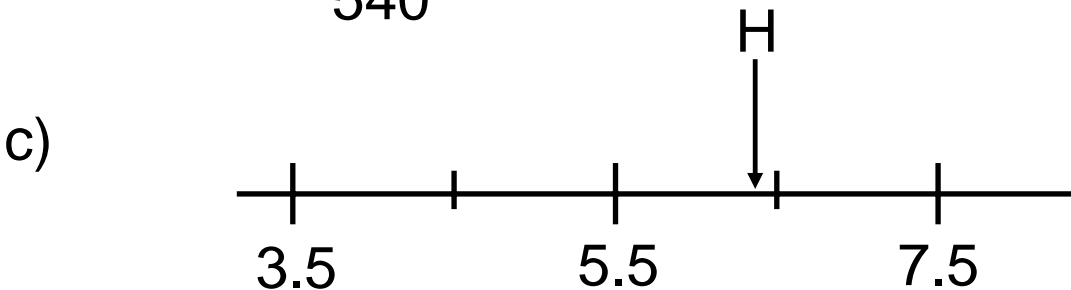
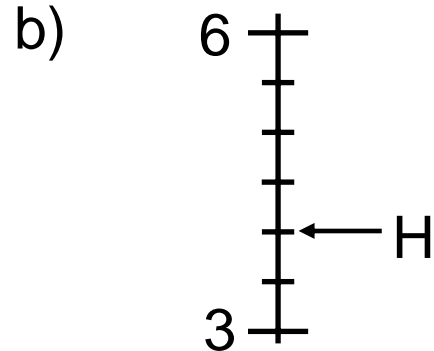
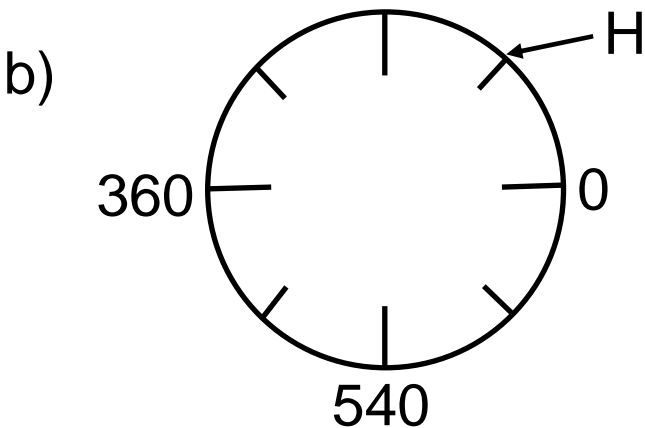
## Notes

## Answers

1.
  - a) 90
  - b) 4
  - c) Possible Answers:  
6.4, 6.45, ...  
(slightly smaller than 6.5)
2. 120
3.
  - a) left
  - b) left
4. Possible Answers:
  - 940 is 240 away from 700 and 260 away from 1200.
  - Halfway between 700 and 1200 is 950. 940 is smaller than 950.
  - By subtraction,  $940 - 700 = 240$  and  $1200 - 940 = 260$ . Therefore, 940 is closer to 700.
  - ...

## Relative Size 7

1. State a possible value for H in each of the following:



2. Name the number halfway between 70 and 170.
3. On a number line, is the number in the box closer to the one on the left or to the one on the right?

a) 700, , 1200

b) 0.6, , 5.5

4. Show that your answer in 3a) is correct in two different ways.