

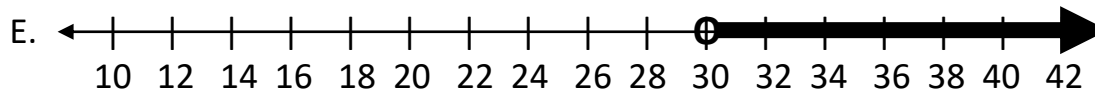
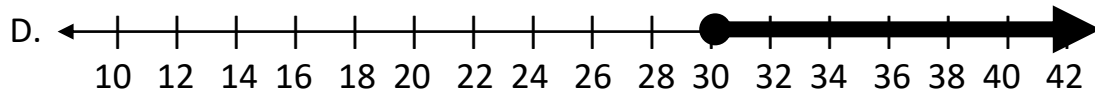
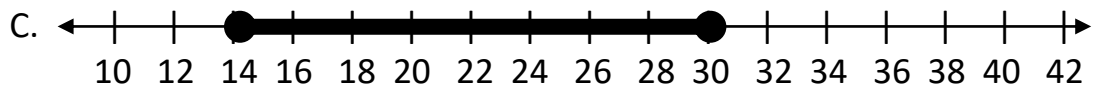
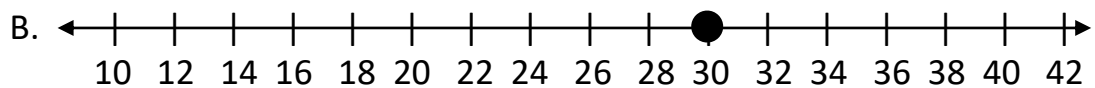
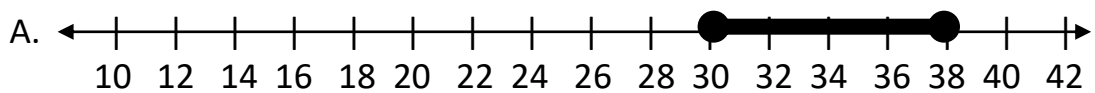
**ALGEBRA**

**Lesson 11 Inequality Word Problems**

**1. CHOOSE THE CORRECT GRAPH WORD PROBLEMS**

**Example 1**

A piano student is required to practice for at least 30 minutes per day. Which graph below shows all of the practice times that will meet this requirement?



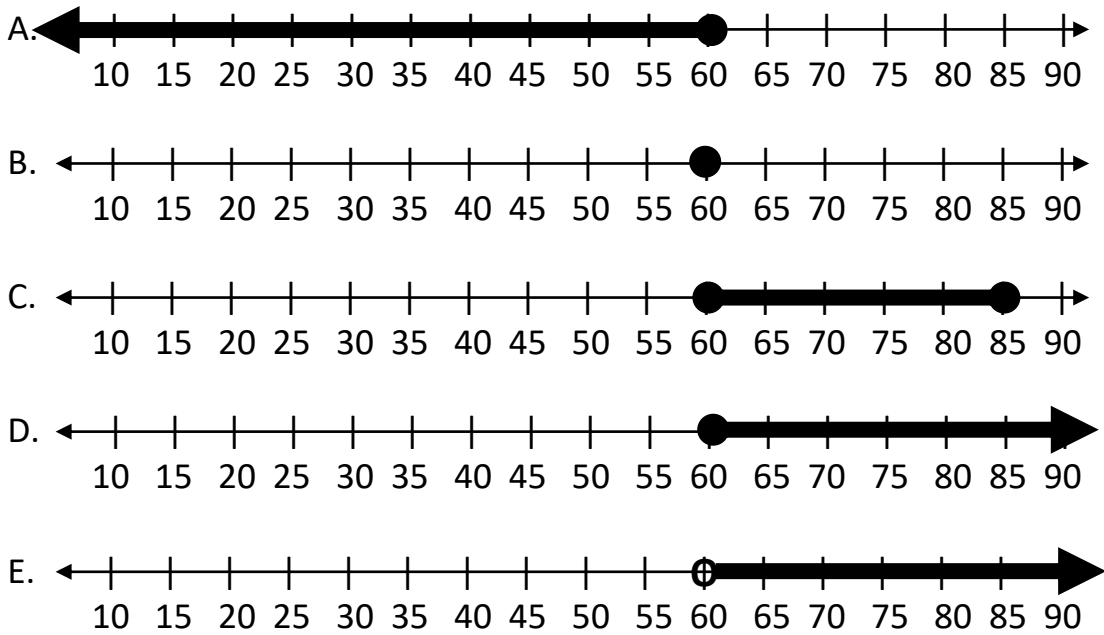
**Answer: D**

At least 30 minutes means 30 is the smallest number of minutes that meets the requirement, and there is no upper limit given.

E. is not correct because it does not include 30 minutes, which is part of the solution.

**Example 2**

An applicant for a data entry job must type at a speed of more than 60 words per minute to qualify for the position. Which graph below shows the acceptable typing speeds?



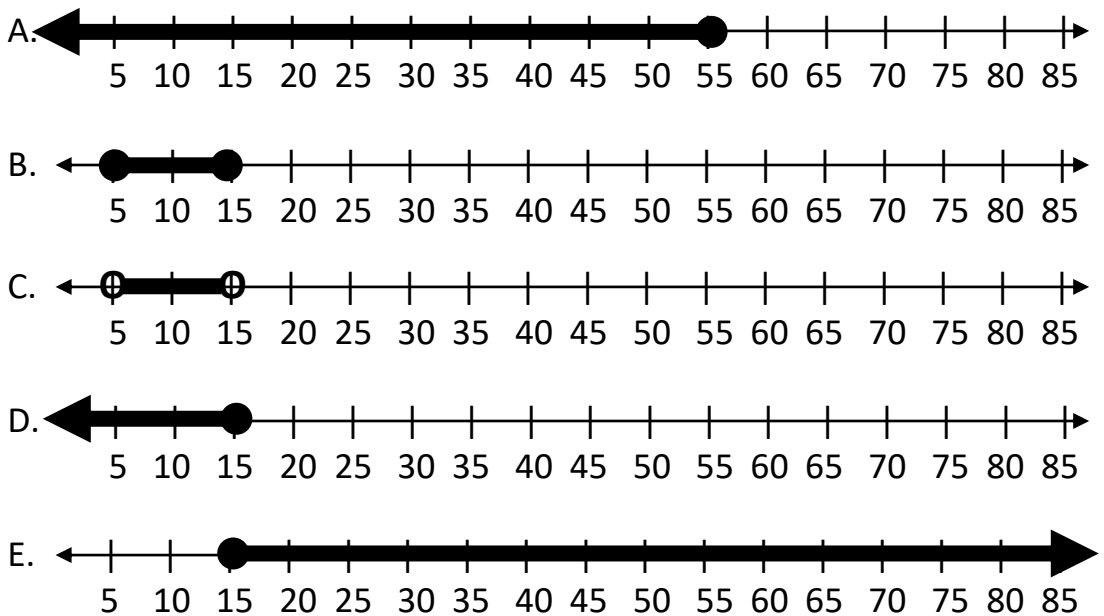
**Answer: E**

More than 60 means the number of words typed has to be greater than 60.

D. is not correct because it includes 60 words which does not meet the stated requirement of more than 60 words.

**Example 3**

Participants in a Secret Santa gift exchange must spend at least \$5 on the gift they bring, but no more than \$15. Which graph below accurately represents this expenditure rule?



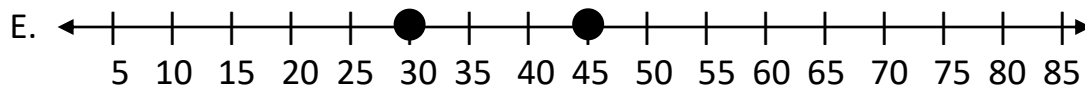
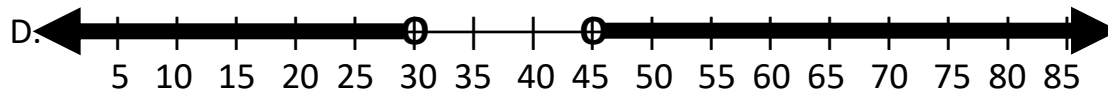
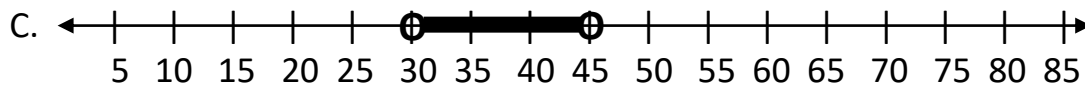
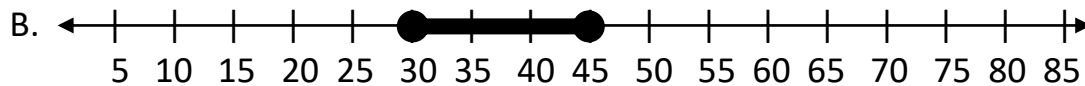
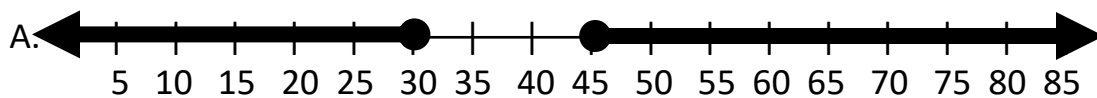
**Answer: B**

At least \$5 but no more than \$15 means any amount from \$5 up to \$15, including \$5 and \$15.

C. is not correct because it does not include \$5 and \$15 and these are part of the solution. At least \$5 means \$5 is the smallest amount, and no more than \$15 means \$15 is the largest amount.

**Example 4**

In order to fit into the available space, a bookcase must be more than 30 inches wide, but less than 45 inches wide. Which graph shows all the acceptable bookcase widths?

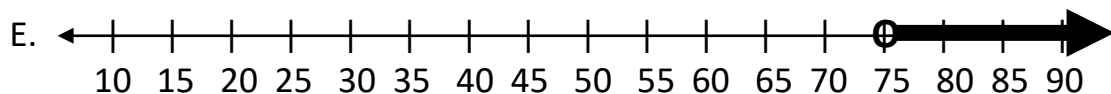
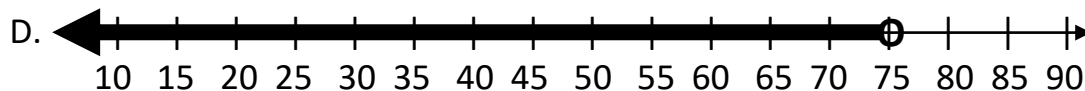
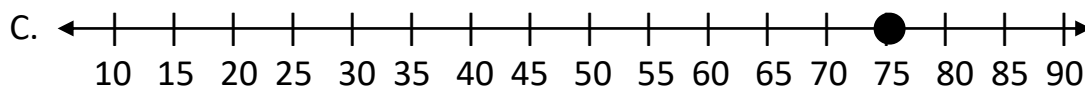
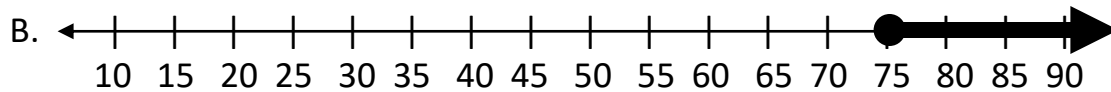
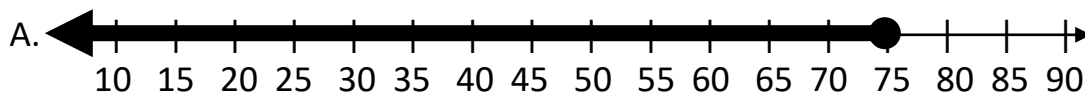


**Answer: C**

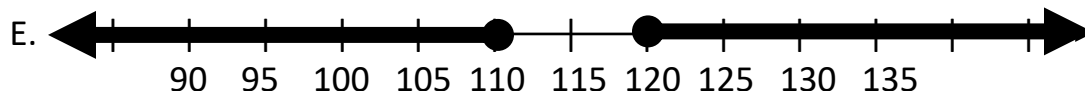
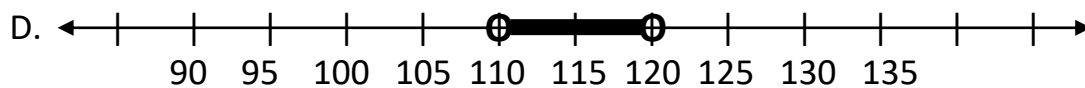
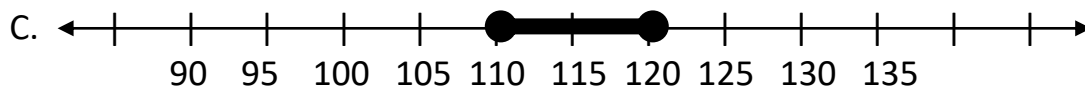
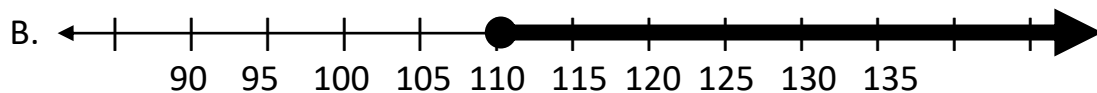
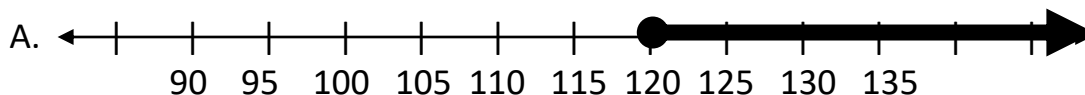
B. is not correct because the bookcase must be more than 30, so the solution does not include the number 30; and it must be less than 45, so the solution does not include the number 45.

**Practice One** Answers – p. 15

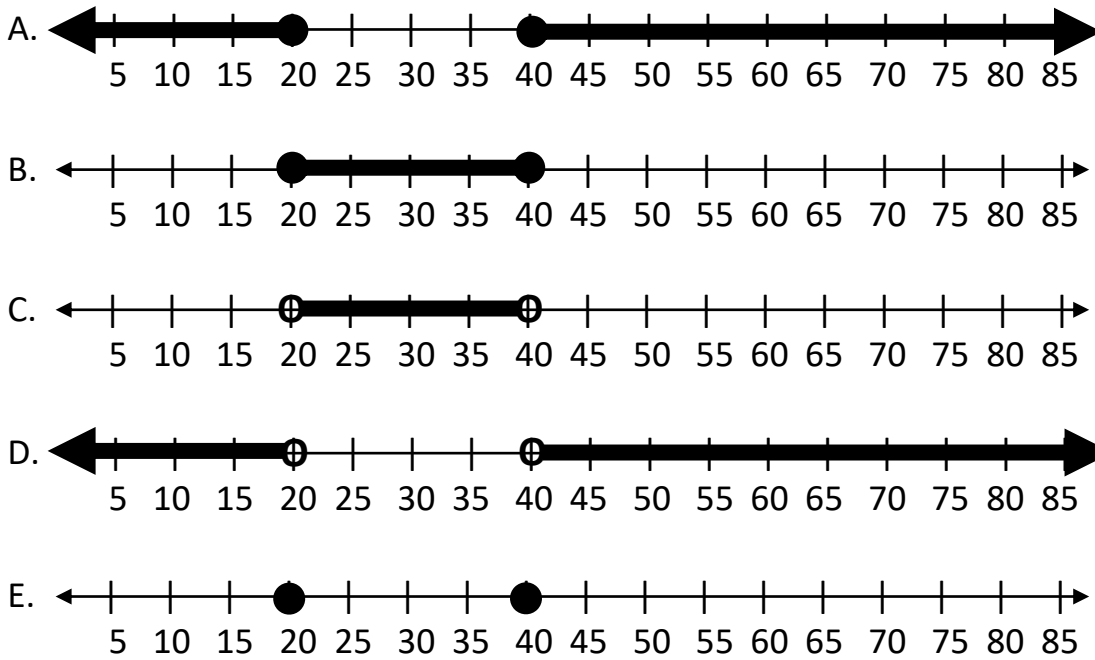
1. Participants in a weight lifting program must bench press at least 75% of their body weight to move to the next level. Which graph shows the acceptable percentages for level advancement?



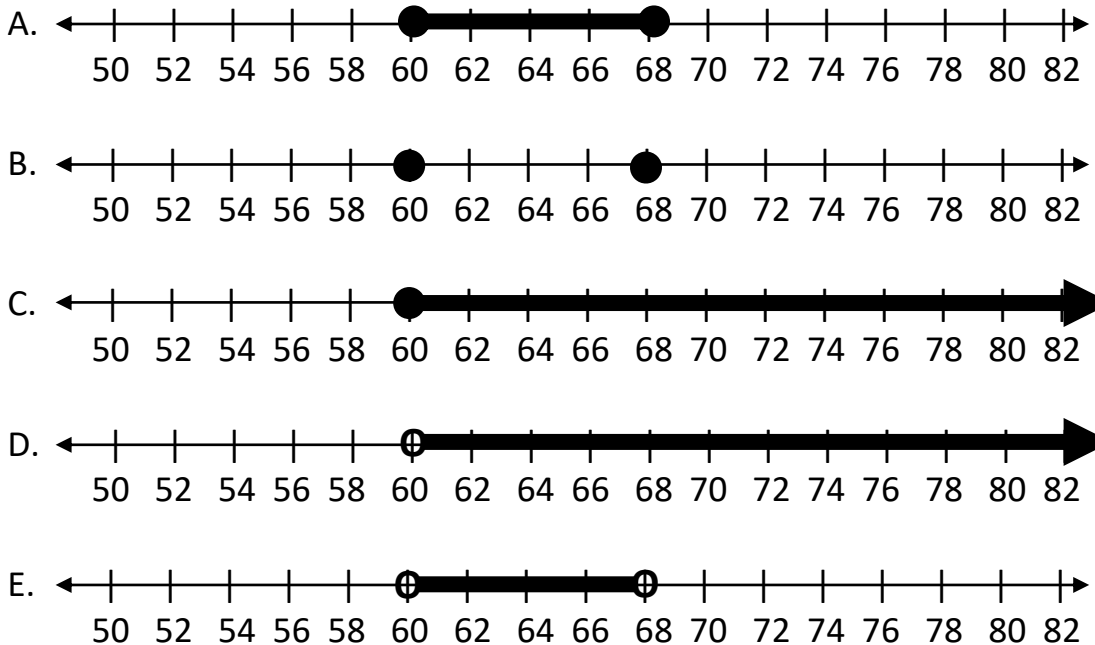
2. To meet portion size specifications, each serving of steak in a restaurant must weigh at least 110 grams but no more than 120 grams. Which graph shows the acceptable weights?



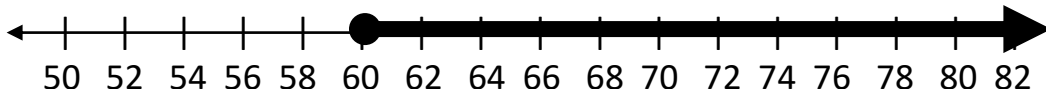
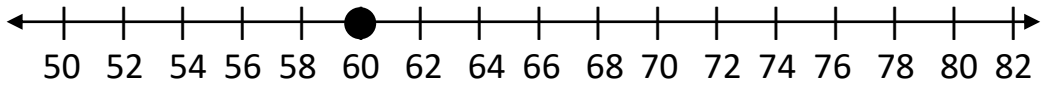
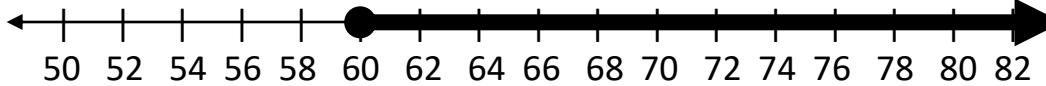
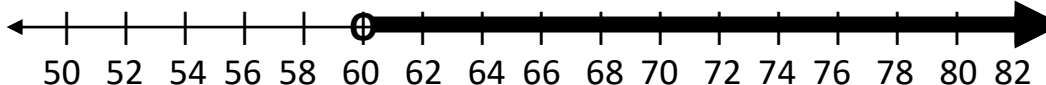
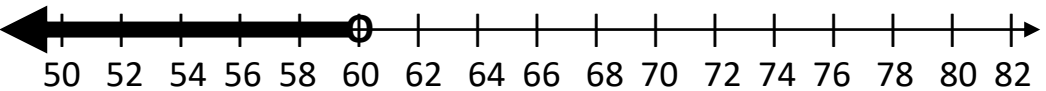
3. A recovering patient is told to exercise for at least 20 minutes per day but no more than 40 minutes per day. Which graph represents the range of acceptable exercise times?



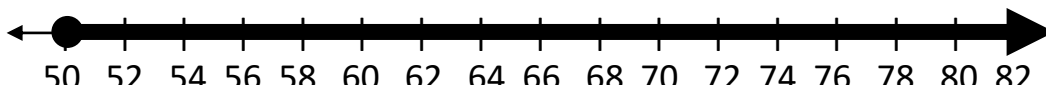
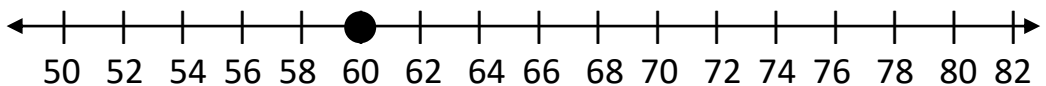
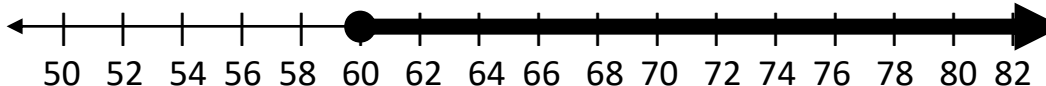
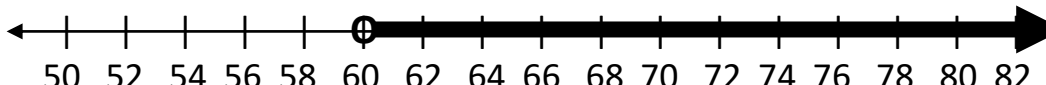
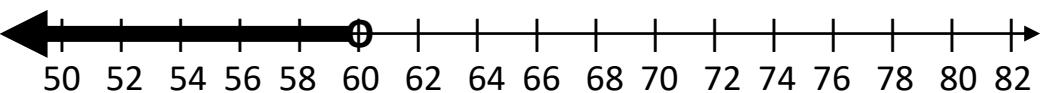
4. For an experiment to work, the temperature must be more than 60 degrees but less than 68 degrees. Which graph shows the range of acceptable temperatures?



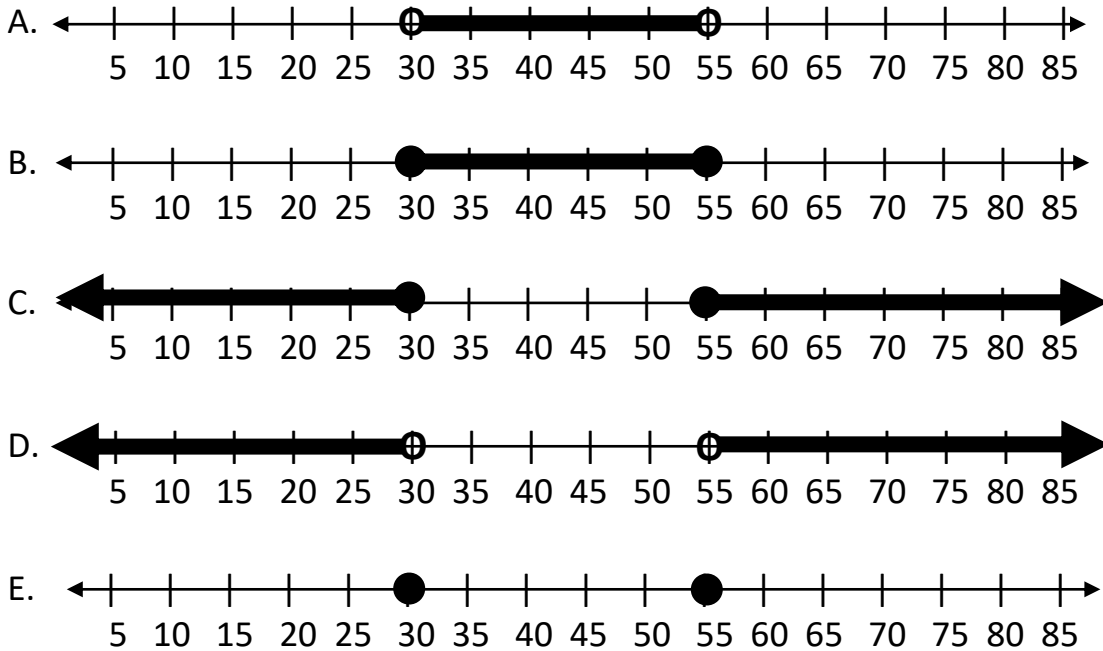
5. Participants in a writing workshop are asked to write for more than 60 minutes per day. Choose a graph that depicts this requirement.

- A. 
- B. 
- C. 
- D. 
- E. 

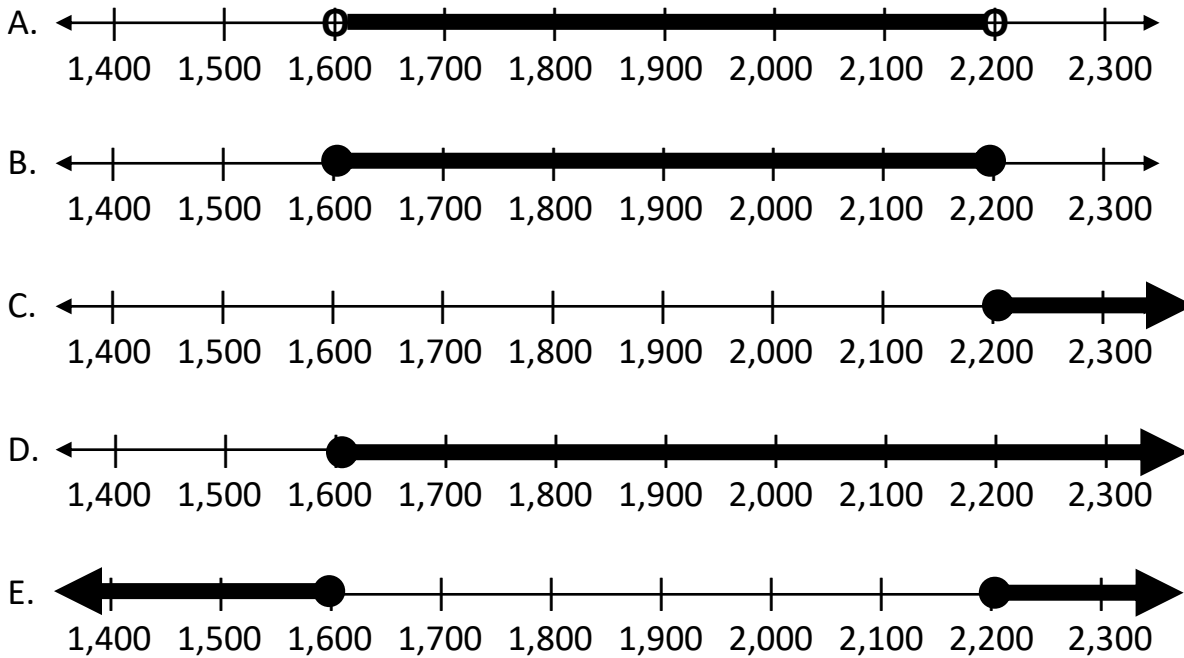
6. Participants in a summer reading program are asked to read for at least 60 minutes per day. Choose a graph that depicts this requirement.

- A. 
- B. 
- C. 
- D. 
- E. 

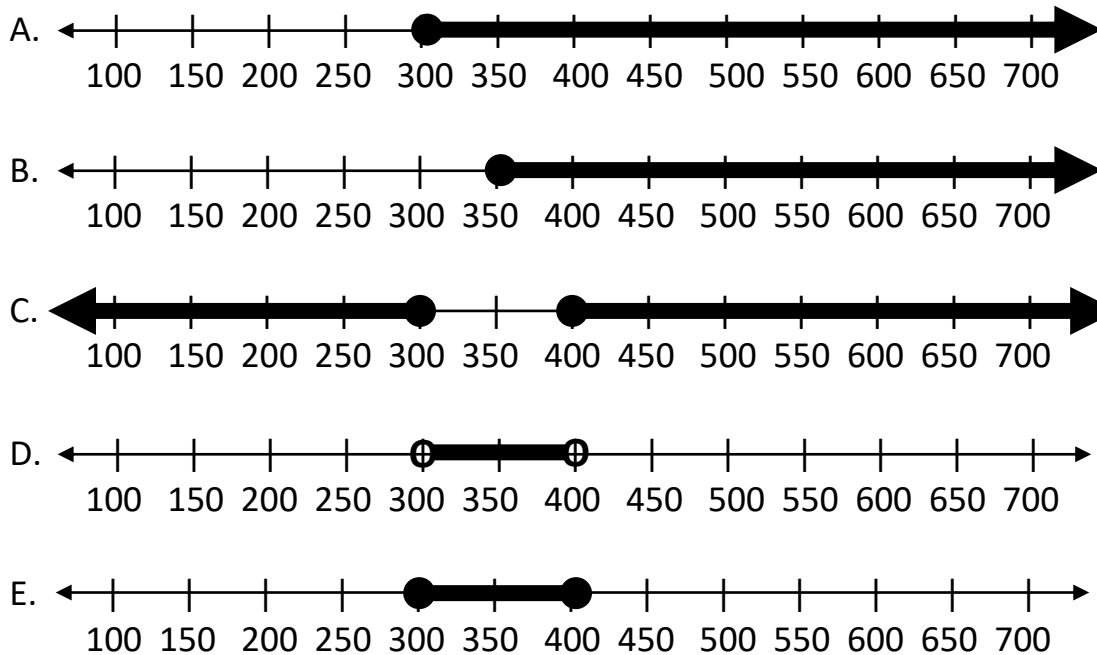
7. A science experiment requires that a beaker be more than 30% full and less than 55% full. Which graph represents the given requirements?



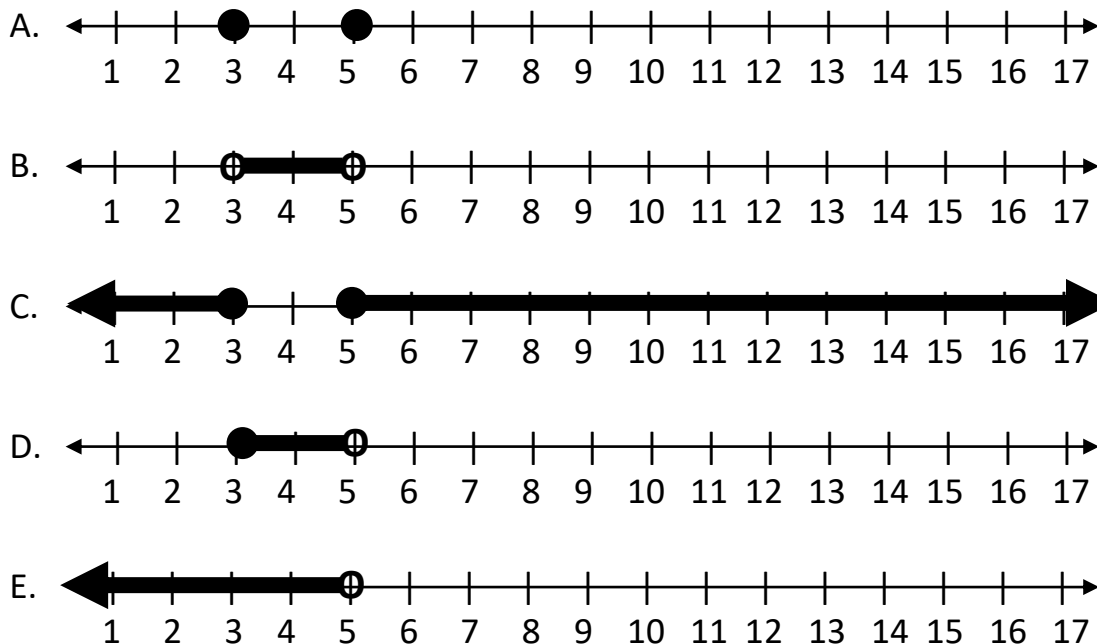
8. Participants in a nutrition study must consume more than 1,600 calories per day but less than 2,200 calories per day. Which graph represents the specified caloric range?



9. A family has agreed on a budget of at least \$300 but no more than \$400 for birthday gifts. Which graph shows their budget?



10. A cookbook says that steaks should rest for at least 3 minutes but less than 5 minutes before serving. Which graph best represents the resting time given in the cookbook?





## 2. CHOOSE THE CORRECT INEQUALITY WORD PROBLEMS

### Example 1

The longest Sue has been able to hold her breath is 34 seconds. Which of the following expresses the amount of time ( $t$ ) she would need to hold her breath to beat her longest time?

- A.  $t = 34$     B.  $t \leq 34$     C.  $t < 34$     D.  $t > 34$     E.  $t \geq 34$

**Answer: D.  $t > 34$**

To beat her longest time, she needs a time that is greater than 34 seconds.

E.  $t \geq 34$  is not correct because  $t = 34$  seconds will not beat her longest time, so 34 is not part of the solution.

### Example 2

Outdoor recess is allowed as long as the temperature is no more than  $90^\circ$ . Choose the answer below that expresses the temperatures ( $t$ ) that will allow for outdoor recess.

- A.  $t = 90^\circ$     B.  $t \leq 90^\circ$     C.  $t < 90^\circ$     D.  $t > 90^\circ$     E.  $t \geq 90^\circ$

**Answer: B.  $t \leq 90^\circ$**

No more than  $90^\circ$  means  $90^\circ$  is the highest acceptable temperature. The temperature must be less than  $90^\circ$  or equal to  $90^\circ$ .

### **Example 3**

A fitness center sells a \$65 pass good for unlimited visits for a month, or patrons can pay a fee of \$5 per visit. Which answer below shows the number of visits ( $v$ ) where it is cheaper to pay per visit than to buy the monthly pass?

- A.  $v > 13$     B.  $v < 13$     C.  $v \geq 13$     D.  $v \leq 13$     E.  $v = 13$

In this problem, you have to calculate the cost of paying per visit compared to the cost of buying the monthly pass, and find: “the number of visits ( $v$ ) where it is cheaper to pay per visit than to buy the monthly pass.”

Notice that all the answers are some form of  $v > 13$ ,  $v < 13$ ,  $v = 13$ .

First determine whether more than 13 visits (answer A.  $v > 13$ ), or less than 13 visits (answer B.  $v < 13$ ) is correct by testing a sample number of visits.

Then, test  $v = 13$  to see if 13 visits is included in the solution.

### **Step 1 Test $v > 13$**

Choose a number greater than 13, and see if it is “cheaper to pay per visit than to buy the monthly pass.”

Test 14 visits: Pay per visit cost:  $14 \times \$5 = \$70$   
Monthly pass: \$65

Visits greater than 13 **do not** meet the requirements of the problem.

It **is not cheaper** to pay per visit (\$70) than to buy the monthly pass (\$65).

So, answer A.  $v > 13$  **is not correct**.

### **Step 2 Test $v < 13$**

Since  $v > 13$  **is not correct**,  $v < 13$  **has to be correct**, but we can test it anyway to be sure.

Choose a number less than 13, and see if it is “cheaper to pay per visit than to buy the monthly pass.”

Test 12 visits: Pay per visit cost:  $12 \times \$5 = \$60$   
Monthly pass: \$65

Visits less than 13 **do** meet the requirements of the problem.

It **is cheaper** to pay per visit (\$60) than to buy the monthly pass (\$65).

So, answer B.  $v < 13$  **is correct**.

### **Step 3 Test $v = 13$**

This will determine whether the correct answer is B.  $v < 13$  or D.  $v \leq 13$ .

Test 13 visits: Pay per visit cost:  $13 \times \$5 = \$65$   
Monthly pass: \$65

If visits = 13, the per visit cost is equal to the monthly pass and this **does not** meet the requirements of the problem. When  $v = 13$  it

**is not cheaper** to pay per visit (\$65) than to buy the monthly pass (\$65).

So, the number 13 **is not** part of the solution and D.  $v \leq 13$  **is not** correct.

**Answer: B.  $v < 13$**

#### **Example 4**

A cell phone company offers a plan with unlimited texts for \$80 per month, or a plan that charges \$0.25 per text. Which answer shows the number of texts ( $t$ ) where is it more expensive to pay per text than to buy the unlimited plan?

- A.  $t = 320$     B.  $t > 320$     C.  $t < 320$     D.  $t \geq 320$     E.  $t \leq 320$

This problem requires you to find: “the number of texts ( $t$ ) where is it more expensive to pay per text than to buy the unlimited plan.”

Notice that all the answers are some form of  $t > 320$ ,  $t < 320$ , or  $t = 320$ .

First determine whether more than 320 texts (answer B.  $t > 320$ ) or less than 320 texts (answer C.  $t < 320$ ) is correct by testing a sample number of texts.

Then, test  $t = 320$  to see if 320 texts is part of the solution.

#### **Step 1 Test $t > 320$**

Choose a number greater than 320, and see if it is “more expensive to pay per text than to buy the unlimited plan.”

Test 330 texts: Pay per text cost:  $330 \times \$0.25 = \$82.50$

Unlimited plan: \$80

Texts greater than 320 *do* meet the requirements of the problem.

It *is more expensive* to pay per text (\$82.50) than to buy the unlimited plan (\$80).

So, answer B.  $t > 320$  *is correct*.

#### **Step 2 Test $t < 320$**

No need to test.

In step 1, we found that  $t > 320$  *is correct*, so  $t < 320$  *cannot be correct*.

#### **Step 3 Test $t = 320$**

This will determine whether the correct answer is B.  $t > 320$  or D.  $t \geq 320$ .

Test 320 texts: Pay per text cost:  $320 \times \$0.25 = \$80$

Unlimited plan: \$80

If texts = 320, the pay per text cost is equal to the unlimited plan cost and this *does not* meet the requirements of the problem. When  $t = 320$  it *is not more expensive* to pay per text (\$80) than to buy the unlimited plan (\$80).

So, the number 320 *is not* part of the solution and D.  $t \geq 320$  *is not* correct.

**Answer: B.  $t > 320$**

### **Example 5**

People in a study are told to exercise for at least 35 minutes per day but no more than 50 minutes per day. Which inequality represents the acceptable range of exercise times ( $t$ )?

- A.  $35 \leq t \leq 50$    B.  $35 < t < 50$    C.  $35 \geq t \geq 50$    D.  $35 > t > 50$    E.  $t < 50$

**Answer: A.  $35 \leq t \leq 50$**

35 minutes is the least time that is acceptable, and 50 minutes is the most time that is acceptable, so  $t$  goes from 35 to 50, and includes 35 and 50.

B.  $35 < t < 50$  is not correct, because it does not include 35 and 50 which are both part of the solution.

C.  $35 \geq t \geq 50$  is not correct even though it does go from 35 to 50, and includes the numbers 35 and 50. How can you tell that answer C. is not correct?

Look at the two inequalities that make up this compound inequality.

The first half of the compound inequality,  $35 \geq t$ , can be converted to  $t \leq 35$ .

So, the two inequalities that make up this compound inequality are:

$$t \leq 35 \quad \text{and} \quad t \geq 50$$

Neither meets the requirements of the problem. Times less than 35 minutes are not acceptable, and times greater than 50 are not acceptable.

*It is also interesting to note* that there is no number that is true for both parts of this compound inequality. A number cannot be less than or equal to 35 and also greater than or equal to 50. So, answer C.  $35 \geq t \geq 50$  is not a valid inequality and cannot be correct.

### **Example 6**

Fabric scraps must be more than 2 inches long and less than 4 inches long in order to be useful for a project. Which answer below represents the acceptable range of lengths ( $l$ )?

- A.  $2 \leq l \leq 4$    B.  $2 < l < 4$    C.  $2 \geq l \geq 4$    D.  $2 > l > 4$    E.  $l < 4$

**Answer: B.  $2 < l < 4$**

The acceptable lengths are between 2 and 4 inches.

A.  $2 \leq l \leq 4$  is not correct because it includes 2 and 4. 2 and 4 are not part of the solution because the scraps must be more than 2 inches and less than 4 inches long.

D.  $2 > l > 4$  is not correct. Even though it does go from 2 to 4 and does not include 2 and 4, neither part of the compound inequality meets the requirements of the problem.

The first half of the compound inequality,  $2 > l$ , can be converted to  $l < 2$ .

So, the two inequalities that make up this compound inequality are:

$$l < 2 \quad \text{and} \quad l > 4$$

Neither meets the requirements of the problem. Lengths less than 2 inches are not acceptable, and lengths greater than 4 inches are not acceptable.

**Practice Two** Answers – p. 17

1. A person's exercise goal is to walk at least 150 minutes ( $m$ ) per week. Which answer below represents times that will meet this goal?

- A.  $m = 150$     B.  $m \leq 150$     C.  $m < 150$     D.  $m > 150$     E.  $m \geq 150$

2. Transit riders can pay \$2 for each bus ride, or buy an unlimited monthly pass for \$60. Which answer below shows the number of rides ( $r$ ) for which it is cheaper to buy the monthly pass than to pay per ride?

- A.  $r = 30$     B.  $r \leq 30$     C.  $r < 30$     D.  $r > 30$     E.  $r \geq 30$

3. Job applicants must have a score of more than 70 on a skills test to be considered for the job. Choose the answer below that represents all qualifying scores ( $s$ ).

- A.  $s = 70$     B.  $s \leq 70$     C.  $s < 70$     D.  $s > 70$     E.  $s \geq 70$

4. A museum charges \$10 admission per visit, or frequent visitors can buy an unlimited annual pass for \$250. For what number of visits ( $v$ ) is it more expensive to buy the annual pass than to pay per visit?

- A.  $v = 25$     B.  $v \leq 25$     C.  $v < 25$     D.  $v > 25$     E.  $v \geq 25$

5. A company can pay \$250 per copier service visit, or buy an annual service contract for \$1,500. For what number of service visits ( $v$ ) is it cheaper to buy the annual contract than to pay the per visit charge?

- A.  $v = 6$     B.  $v \leq 6$     C.  $v < 6$     D.  $v > 6$     E.  $v \geq 6$

6. If a display table must be at least 6 feet long but no more than 8 feet long, which inequality represents the range of acceptable lengths ( $l$ )?

- A.  $6 \leq l \leq 8$     B.  $6 < l < 8$     C.  $6 \geq l \geq 8$     D.  $6 > l > 8$     E.  $l < 8$

7. A person is collecting shells for a craft project. To fit the project, the shells must be less than 5 inches wide but more than 3 inches wide. Which answer below represents the shell widths ( $w$ ) that will fit the project?

- A.  $5 \leq w \leq 3$     B.  $5 < w < 3$     C.  $5 \geq w \geq 3$     D.  $5 > w > 3$     E.  $w < 3$

8. One wrestling weight class requires that weights be at least 145 pounds but less than 152 pounds. Which answer shows the allowable weights ( $w$ ) for this weight class?

- A.  $145 \leq w \leq 152$                       B.  $145 < w < 152$                       C.  $145 \geq w \geq 152$   
D.  $145 \leq w < 152$                       E.  $w < 152$

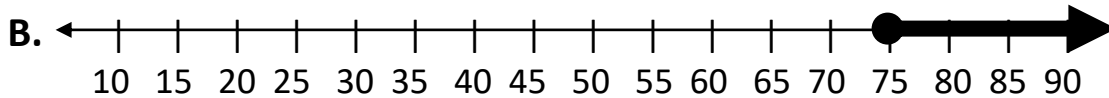
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## ANSWER KEY Lesson 11 Inequality Word Problems

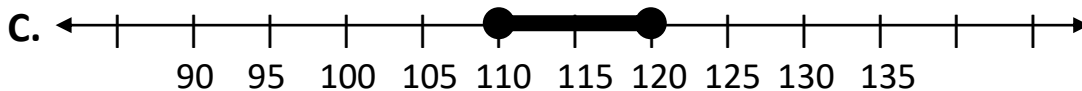
### **Practice One**

1. Participants in a weight lifting program must bench press at least 75% of their body weight to move to the next level. Which graph shows the acceptable percentages for level advancement?



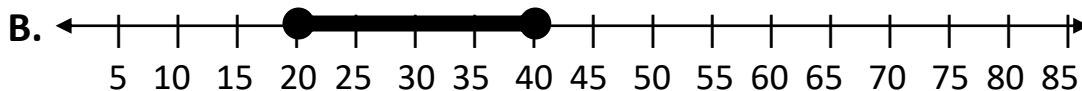
At least 75% means that 75% is the smallest acceptable number, and there is no upper limit given.

2. To meet portion size specifications, each serving of steak in a restaurant must weigh at least 110 grams but no more than 120 grams. Which graph shows the acceptable weights?



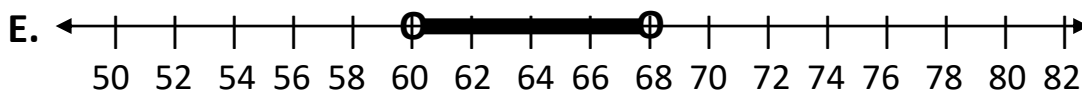
At least 110 grams means 110 is the lowest number of grams allowed. No more than 120 grams means that 120 is the highest number of grams allowed.

3. A recovering patient is told to exercise for at least 20 minutes per day but no more than 40 minutes per day. Which graph represents the range of acceptable exercise times?



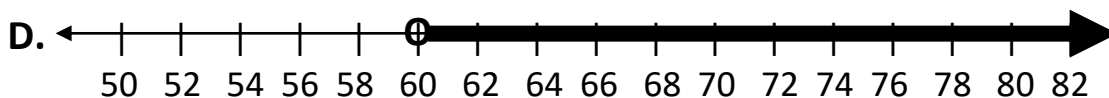
At least 20 minutes means 20 minutes is the lowest acceptable time. No more than 40 minutes means that 40 minutes is the highest acceptable time.

4. For an experiment to work, the temperature must be more than 60 degrees but less than 68 degrees. Which graph shows the range of acceptable temperatures?



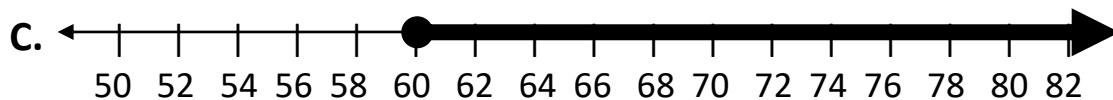
60 and 68 are not part of the solution, because temperatures must be more than 60 and less than 68.

5. Participants in a writing workshop are asked to write for more than 60 minutes per day. Choose a graph that depicts this requirement.



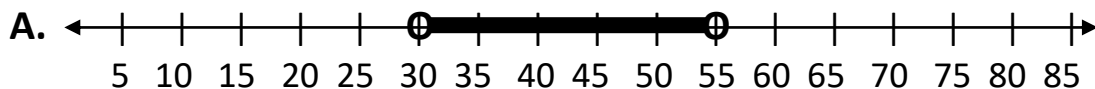
60 is not part of the solution because students must write for more than 60 minutes.

6. Participants in a summer reading program are asked to read for at least 60 minutes per day. Choose a graph that depicts this requirement.



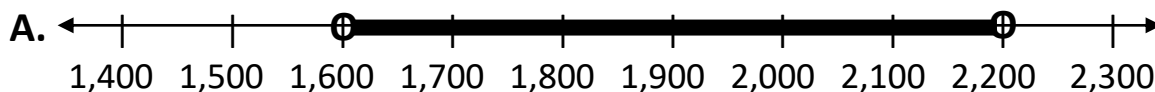
60 is part of the solution because at least 60 means that 60 is the smallest number of minutes that is acceptable.

7. A science experiment requires that a beaker be more than 30% full and less than 55% full. Which graph represents the given requirements?



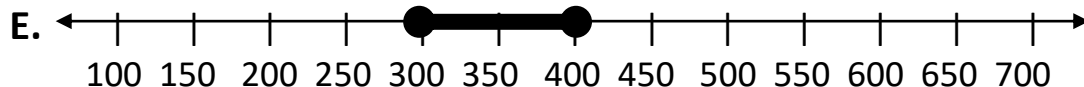
30 and 55 are not part of the solution, because the beaker must be more than 30% full and less than 55% full.

8. Participants in a nutrition study must consume more than 1,600 calories per day but less than 2,200 calories per day. Which graph represents the specified caloric range?



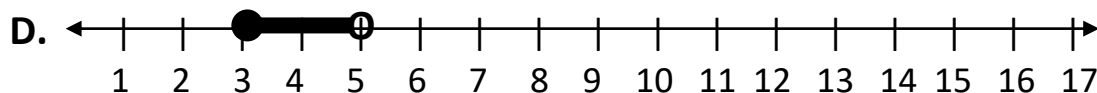
1,600 and 2,200 are not part of the solution because participants must consume more than 1,600 calories and less than 2,200 calories.

9. A family has agreed on a budget of at least \$300 but no more than \$400 for birthday gifts. Which graph shows their budget?



At least \$300 means \$300 is the lowest acceptable amount. No more than \$400 means that \$400 is the highest acceptable amount.

10. A cookbook says that steaks should rest for at least 3 minutes but less than 5 minutes before serving. Which graph best represents the resting time given in the cookbook?



3 is part of the solution because at least 3 minutes means that 3 is lowest amount of minutes that is acceptable. 5 is not part of the solution because the resting time must be less than 5 minutes.



## Practice Two

1. A person's exercise goal is to walk at least 150 minutes ( $m$ ) per week. Which answer below represents times that will meet this goal?

- A.  $m = 150$     B.  $m \leq 150$     C.  $m < 150$     D.  $m > 150$     E.  $m \geq 150$

**Answer: E.  $m \geq 150$**

At least 150 minutes means 150 is the smallest number of minutes allowed.

D.  $m > 150$  is not correct because it does not include 150. 150 minutes will meet the goal, so 150 must be part of the solution.

2. Transit riders can pay \$2 for each bus ride, or buy an unlimited monthly pass for \$60. Which answer below shows the number of rides ( $r$ ) for which it is cheaper to buy the monthly pass than to pay per ride?

- A.  $r = 30$     B.  $r \leq 30$     C.  $r < 30$     D.  $r > 30$     E.  $r \geq 30$

**Answer: D.  $r > 30$**

**First, determine if C.  $r < 30$  or D.  $r > 30$  is correct.**

Test a number of rides less than 30, and see if it is "cheaper to buy the monthly pass than to pay per ride".

Test 25 rides: Per ride cost:  $25 \times \$2 = \$50$

Monthly pass: \$60

Rides less than 30 **do not** meet the requirements of the problem.

It **is not cheaper** to buy the monthly pass (\$60) than to pay per ride (\$50), so C.  $r < 30$  **is not correct**.

Since C.  $r < 30$  **is not correct**, D.  $r > 30$  **has to be correct**.

**Second, determine if  $r = 30$  is part of the solution.**

Test  $r = 30$  so you can decide if the answer is D.  $r > 30$  or E.  $r \geq 30$ .

Test 30 rides: Per ride cost:  $30 \times \$2 = \$60$

Monthly pass: \$60

If rides = 30, the per ride cost is equal to the monthly pass, and this **does not** meet the requirements of the problem. When  $r = 30$ , it **is not cheaper** to buy the monthly pass (\$60) than to pay per ride (\$60).

So, the number 30 **is not** part of the solution and E.  $r \geq 30$  **is not** correct.

3. Job applicants must have a score of more than 70 on a skills test to be considered for the job. Choose the answer below that represents all qualifying scores ( $s$ ).

- A.  $s = 70$     B.  $s \leq 70$     C.  $s < 70$     D.  $s > 70$     E.  $s \geq 70$

**Answer: D.  $s > 70$**

More than 70 means the score has to be greater than 70.

E.  $s \geq 70$  is not correct because it includes 70, which does not meet the requirement to be more than 70.

4. A museum charges \$10 admission per visit, or frequent visitors can buy an unlimited annual pass for \$250. For what number of visits ( $v$ ) is it more expensive to buy the annual pass than to pay per visit?

- A.  $v = 25$     B.  $v \leq 25$     C.  $v < 25$     D.  $v > 25$     E.  $v \geq 25$

**Answer: C.  $v < 25$**

**First, determine if C.  $v < 25$  or D.  $v > 25$  is correct.**

Test a number of visits less than 25, and see if it is “more expensive to buy the annual pass than to pay per visit”.

Test 24 visits: Per visit cost:  $24 \times \$10 = \$240$

Annual pass: \$250

Visits less than 25 *do* meet the requirements of the problem.

It *is more expensive* to buy the annual pass (\$250) than to pay per visit (\$240), so C.  $v < 25$  *is correct*.

Since C.  $v < 25$  *is correct*, D.  $v > 25$  *cannot be correct*.

**Second, determine if  $v = 25$  is part of the solution.**

Test  $v = 25$  so you can decide if the answer is C.  $v < 25$  or B.  $v \leq 25$

Test 25 visits: Per visit cost:  $25 \times \$10 = \$250$

Annual pass: \$250

If visits = 25, the per visit cost is equal to the annual pass, and this *does not* meet the requirements of the problem. When  $v = 25$ , it *is not more expensive* to buy the annual pass (\$250) than to pay per visit (\$250).

So, the number 25 *is not* part of the solution and B.  $v \leq 25$  *is not* correct.

5. A company can pay \$250 per copier service visit, or buy an annual service contract for \$1,500. For what number of service visits ( $v$ ) is it cheaper to buy the annual contract than to pay the per visit charge?

- A.  $v = 6$     B.  $v \leq 6$     C.  $v < 6$     D.  $v > 6$     E.  $v \geq 6$

**Answer: D.  $v > 6$**

**First, determine if C.  $v < 6$  or D.  $v > 6$  is correct.**

Test a number less than 6, and see if it is “cheaper to buy the annual contract than to pay the per visit charge”.

Test 5 visits: Per visit cost:  $5 \times \$250 = \$1,250$

Annual contract: \$1,500

Visits less than 6 **do not** meet the requirements of the problem.

It **is not cheaper** to buy the annual contract (\$1,500) than to pay the per visit charge (\$1,250), so C.  $v < 6$  **is not correct**.

Since C.  $v < 6$  **is not correct**, D.  $v > 6$  **has to be** correct.

**Second, determine if  $v = 6$  is part of the solution.**

Now, test  $v = 6$  so you can decide if the answer is D.  $v > 6$  or E.  $v \geq 6$

Test 6 visits: Per visit cost:  $6 \times \$250 = \$1,500$

Annual contract: \$1,500

If visits = 6, the per visit cost is equal to the annual contract, and this does not meet the requirements of the problem. When  $v = 6$ , it **is not cheaper** to buy the annual contract (\$1,500) than to pay the per visit charge (\$1,500).

So the number 6 **is not** part of the solution and E.  $v \geq 6$  **is not** correct.

6. If a display table must be at least 6 feet long but no more than 8 feet long, which inequality represents the range of acceptable lengths ( $l$ )?

- A.  $6 \leq l \leq 8$     B.  $6 < l < 8$     C.  $6 \geq l \geq 8$     D.  $6 > l > 8$     E.  $l < 8$

**Answer: A.  $6 \leq l \leq 8$**

6 feet is the smallest acceptable length, and 8 feet is the largest acceptable length, so  $l$  goes from 6 to 8, and includes 6 and 8.

B.  $6 < l < 8$  is not correct because it does not include 6 and 8 which are both part of the solution.

C.  $6 \geq l \geq 8$  is not correct. Even though it goes from 6 to 8, and includes 6 and 8, neither part of the compound inequality meets the requirements of the problem.

The first half of the compound inequality,  $6 \geq l$ , can be converted to  $l \leq 6$ .

So, the two inequalities that make up this compound inequality are:

$$l \leq 6 \quad \text{and} \quad l \geq 8$$

Neither meets the requirements of the problem. Lengths less than 6 feet are not acceptable, and lengths greater than 8 feet are not acceptable.

7. A person is collecting shells for a craft project. To fit the project, the shells must be less than 5 inches wide but more than 3 inches wide. Which answer below represents the shell widths ( $w$ ) that will fit the project?

- A.  $5 \leq w \leq 3$    B.  $5 < w < 3$    C.  $5 \geq w \geq 3$    D.  $5 > w > 3$    E.  $w < 3$

**Answer: D.  $5 > w > 3$**

The acceptable lengths are between 5 and 3 inches.

C.  $5 \geq w \geq 3$  is not correct because it includes 5 and 3. 5 and 3 are not part of the solution because the shells must be less than 5 inches wide and more than 3 inches wide.

B.  $5 < w < 3$  is not correct. Even though it does go from 5 to 3 and does not include 5 and 3, neither part of the compound inequality meets the requirements of the problem.

The first half of the compound inequality,  $5 < w$ , can be converted to  $w > 5$ .

So, the two inequalities that make up this compound inequality are:

$$w > 5 \quad \text{and} \quad w < 3$$

Neither meets the requirements of the problem. Widths greater than 5 inches are not acceptable, and widths less than 3 inches are not acceptable.

8. One wrestling weight class requires that weights be at least 145 pounds but less than 152 pounds. Which answer shows the allowable weights ( $w$ ) for this weight class?

- A.  $145 \leq w \leq 152$                       B.  $145 < w < 152$                       C.  $145 \geq w \geq 152$   
D.  $145 \leq w < 152$                       E.  $w < 152$

**Answer: D.  $145 \leq w < 152$**

The acceptable weights are between 145 and 152. 145 is the lowest acceptable weight, so 145 is part of the solution. Weights must be less than 152, so 152 is not part of the solution.

A.  $145 \leq w \leq 152$  is not correct because it includes 152.

B.  $145 < w < 152$  is not correct because it does not include 145.