Math

Released Item 2015

Grade 6
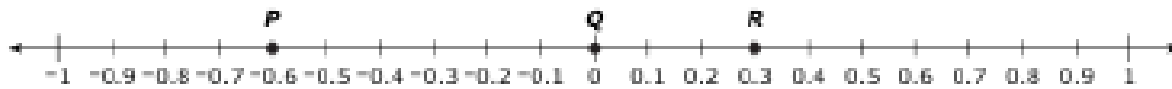
PBA Item #13

Distances and Locations

1167-M20992

Prompt

Points *P*, *Q*, and *R* are shown on the number line.

$$P \quad\quad Q \quad\quad R$$

⁻1	⁻0.9	⁻0.8	⁻0.7	⁻0.6	⁻0.5	⁻0.4	⁻0.3	⁻0.2	⁻0.1	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

Part A

Find the distances between points *P* and *Q* and between points *R* and *Q*. Show your work or explain your answer. Refer to the number line in your explanation.

Enter your answers and your work or explanation in the space provided.

Part B

Point *S* is a different point on the number line. Point *S* and point *R* are the same distance from point *Q*. Explain how to determine the location of point *S* on the number line.

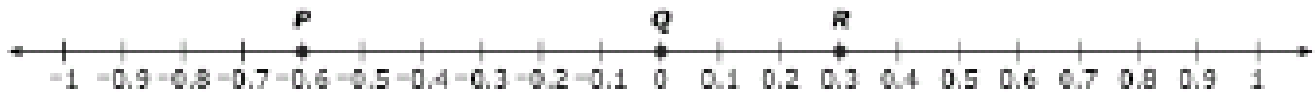Enter your explanation in the space provided.

Task is worth a total of 3 points.

1167-M20992 Rubric Part A	
Score	**Description**

2	Student response includes each of the following 2 elements.
	
	    • **Reasoning component** = 1 point
	
	        o Correct work shown or explanation given using the number line
	
	    • **Computation component** = 1 point
	
	        o Correct distance of each point from Q (0.3 for R and 0.6 for P)
	
	Sample Student Response:
	    Point R is 0.3 unit from point Q, because there are 3 spaces of 0.1 between them on the number line.
	    Point P is 0.6 unit from point Q, because there are 6 spaces of 0.1 between them on the number line.

1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.
1167-M20992 Rubric Part B	
Score	**Description**

1	Student response includes the following element.
	
	    • **Reasoning component** = 1 point
	
	        o Correct explanation of how to find point S on the number line
	
	Sample Student Response:
	    Since point Q is at 0 and since point S is the same distance from point Q as point R but in a different location, it must be on the opposite side of point Q. Points R and S are on opposite sides of 0 on the number line, so their locations should have opposite signs. Since point R is located at 0.3, point S must be located at -0.3.
	
	Note: Point S can also be located at 0.3 for credit with a valid explanation.

0	Student response is incorrect or irrelevant.

Anchor Set
A1 – A8

Points *P*, *Q* and *R* are shown on the number line.

Part A

Find the distances between points *P* and *Q* and between points *R* and *Q*. Show your work or explain your answer. Refer to the number line in your explanation.

> The distance between points p and q is 0.6. the distance between points r and q is 0.3.
> $0 + 0.6 = 0.6$ $0 + 0.3 = 0.3$

Part B

Point *S* is a different point on the number line. Point *S* and point *R* are the same distance from point *Q*. Explain how to determine the location of point *S* on the number line.

> To determine point s on the number line you have to subtract 0.3 from zero and you get -0.3

Annotations

Anchor Paper 1

Part A: Score Point 2

This response receives full credit. The student includes each of the two required elements:

- The correct distance between points *P* and *Q* and points *R* and *Q* is determined (*The distance between points p and q is 0.6. the distance between points r and q is 0.3*).
- Correct work or explanation showing how to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line is provided (*0+0.6=0.6, 0+0.3=0.3*). The student correctly uses the values from the number line to show how to find the distance between both sets of points.
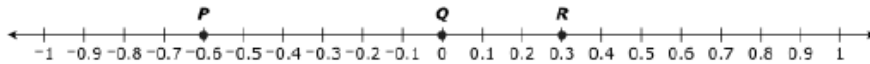
Part B: Score Point 1

This response receives full credit. The student includes the required element:

- A correct explanation for how to find point *S* on the number line is provided (*subtract 0.3 from zero*).

Points P, Q, and R are shown on the number line.

Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

> 0.6 and 0.3. I found this out by finding the absolute value of p and r because q is 0

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

> you have to figure out the absolute value of r which is .3 and the only other number on that number line that has that same absolut value or distance from zero is the opposite which is -0.3
> so, s equals
> -0.3

Annotations

Anchor Paper 2

Part A: Score Point 2

This response receives full credit. The student includes each of the two required elements:

- The correct distance between points *P* and *Q* and between points *R* and *Q* is determined (*0.6 and 0.3*).
- Correct work or explanation showing how to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line is provided (*I found this out by finding the absolute value of p and r because q is 0*).

Part B: Score Point 1

This response receives full credit. The student includes the required element:

- A correct explanation for how to find point *S* on the number line is provided (*you have to figure out the absolute value of r which is .3 and the only other number on that number line that has that same absolut value or distance from zero is the opposite which is -0.3*).

Points P, Q and R are shown on the number line.
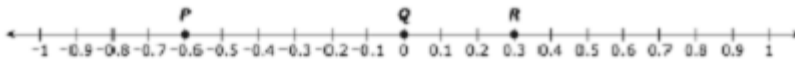
Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

> $p = .6\ r = .3$
> so p would be .6 spaces away and r would be .3
> spaces away if you count on the nomber line you can
> see this

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

> well if s is the same distance but a different number
> than it would have the same absulout value so that
> number is .6

Annotations

Anchor Paper 3
Part A: Score Point 2

This response receives full credit. The student includes each of the two required elements:

- The correct distance between points *P* and *Q* and between points *R* and *Q* is determined (*.6, .3*).
- Correct work or explanation showing how to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line is provided (*p would be .6 spaces away*, *r would be .3 spaces away*).
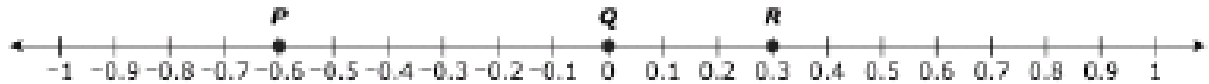
Part B: Score Point 0

This response receives no credit. The student does not include the required element:

The explanation provided for how to find point *S* on the number line includes an incorrect answer, so this response does not receive credit for this element (*so that number is .6*).

Points *P*, *Q* and *R* are shown on the number line.

Part A

Find the distances between points *P* and *Q* and between points *R* and *Q*. Show your work or explain your answer. Refer to the number line in your explanation.

> point p is .6 away from point q
> point r is .3 away from point q

Part B

Point *S* is a different point on the number line. Point *S* and point *R* are the same distance from point *Q*. Explain how to determine the location of point *S* on the number line.

> to determine the location of point s is to find the exact opisit of point r so it must be at −.3 on the number line

Annotations

Anchor Paper 4
Part A: Score Point 1

This response receives partial credit. The student includes one of the two required elements:

The correct distance between points *P* and *Q* and between points *R* and *Q* is determined (*point p is .6 away from point q, point r is .3 away from point q*).

The response does not show correct work or explain how to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line.
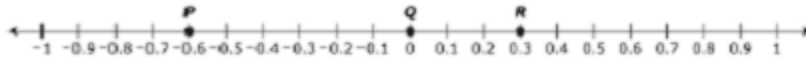
Part B: Score Point 1

This response receives full credit. The student includes the required element:

- A correct explanation for how to find point *S* on the number line is provided (*find the exact opisit of point r so it must be at -.3*).

Points P, Q and R are shown on the number line.

Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

the distances between points P and Q are negative 6 tenths because on the number line it shows point P being 6 tenths behind of point Q. the distance between points R and Q are positive 3 tenths because on the number line it shows point R being 3 tenths infront of point Q.

▸ Numbers
▸ Arithmetic and Units
▸ Exponents and Roots
▸ Relations
▸ Geometry
▸ Groups

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

Point S is negative 3 tenths on the number line because if S is a different point on the number line but is the same distance from Q as R is and R is positive 3 tenths away from Q then so is S but instead of positive 3 tenths, S is negative 3 tenths.

▸ Numbers
▸ Arithmetic and Units
▸ Exponents and Roots
▸ Relations
▸ Geometry
▸ Groups

Anchor Paper 5
Part A: Score Point 0

This response receives no credit. The student does not include any of the two required elements:

An incorrect answer is provided (the distances between points P and Q are negative 6 tenths . . . the distance between points R and Q are positive 3 tenths). Note: although the distance between R and Q is correct, the distance between P and Q is incorrect. Both distances must be correct to receive credit for this element.

The explanation to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line is incorrect (*P and Q are negative 6 tenths because on the number line it shows point P being 6 tenths behind of point Q*). Note: distance must be a positive number.

Part B: Score Point 1

This response receives full credit. The student includes the required element:

- A correct explanation for how to find point *S* on the number line is provided (if S is a different point on the number line but is the same distance from Q as R is and R is positive 3 tenths away from Q then so is S but instead of positive 3 tenths, S is negative 3 tenths).

Points P, Q, and R are shown on the number line.
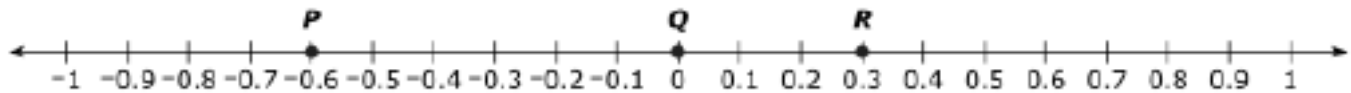
Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

> p and $q = 0.6$ q and $r = 0.3$

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

> its 9

Annotations

Anchor Paper 6

Part A: Score Point 1

This response receives partial credit. The student includes one of the two required elements:

- The correct distances between points *P* and *Q* and points *R* and *Q* are determined (*0.6, 0.3*).

The response does not show correct work or explain how to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line.
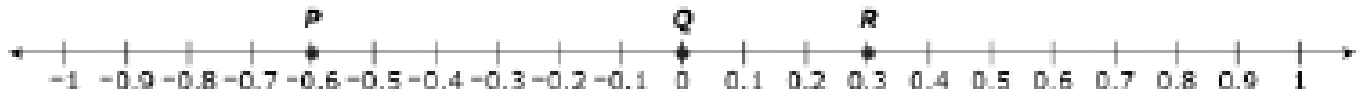
Part B: Score Point 0

This response receives no credit. The student does not include the required element:

The response does not include an explanation of how to find point *S* on the number line (*its 9*).

Points P, Q, and R are shown on the number line.

Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

$$p + q = -0.6$$
$$q + r = 0.3$$

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

$$r = s = 0.3$$

Annotations

Anchor Paper 7
Part A: Score Point 0

This response receives no credit. The student does not include any of the two required elements:

The correct answer is not provided.

The work shown to find the distance between points P and Q and between points R and Q using the number line is partially incorrect ($p+q=-0.6$, $q+r=0.3$). Note: distance must be a positive number.
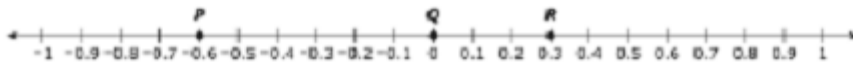
Part B: Score Point 0

This response receives no credit. The student does not include the required element:

The explanation provided for how to find point S on the number line is incorrect ($r=s=0.3$).

Points P, Q and R are shown on the number line.

Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

0.6
-0
$\square = 0.6$

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

how u determin where point s is on the number line is count how far r is from q and then you count the same amount of numbers it took r to get to q and then you count the same amount for s nd then it would land on -0.2 and then count from -0.2 till it takes you to q and then they will both take two jumps to get to q from s and the same for r to q

Annotations

Anchor Paper 8
Part A: Score Point 0

This response receives no credit. The student does not include any of the two required elements:

An incomplete answer is provided. Although one correct distance was determined (*0.6*), both distances must be provided to receive credit.

The work shown to find the distance between points *P* and *Q* and between points *R* and *Q* using the number line is incomplete (*0.6-0=0.6*). An explanation or work must be shown for both distances to receive credit.

Part B: Score Point 0

This response receives no credit. The student does not include the required element:

The explanation provided for how to find point S on the number line is incorrect (it would land on -0.2 . . . they will both take two jumps to get to q from s and the same for r to q).

Practice Set
P101 - P105

Points *P*, *Q* and *R* are shown on the number line.
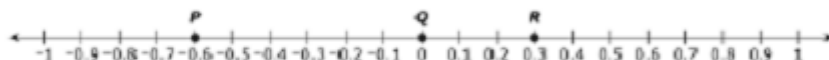
Part A

Find the distances between points *P* and *Q* and between points *R* and *Q*. Show your work or explain your answer. Refer to the number line in your explanation.

$P(-0.6)$ and $Q(0)$ are .6 away from each other because you would have to move over 6 spots to get to the 0 and then $Q(0)$ and $R(0.3)$ are .3 away from each other because you would have to move over Q by .3 to get to R

> Numbers
> Arithmetic and Units
> Exponents and Roots
> Relations
> Geometry
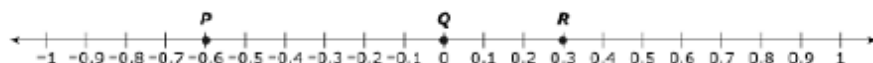> Groups

Part B

Point *S* is a different point on the number line. Point *S* and point *R* are the same distance from point *Q*. Explain how to determine the location of point *S* on the number line.

point S is -0.3 because it is the same distance from the number $Q(0)$ as point R and point R is .3 away from Q and it isnt the in the same spot as point R so that means you have to go the other way so it would be -0.3

> Numbers
> Arithmetic and Units
> Exponents and Roots
> Relations
> Geometry
> Groups

Points *P*, *Q*, and *R* are shown on the number line.

Part A

Find the distances between points *P* and *Q* and between points *R* and *Q*. Show your work or explain your answer. Refer to the number line in your explanation.

i think the distence from point p to q is 6 and i think the points q to r is 3

> Numbers
> Arithmetic and Units
> Exponents and Roots
> Relations
> Geometry
> Groups

Part B

Point *S* is a different point on the number line. Point *S* and point *R* are the same distance from point *Q*. Explain how to determine the location of point *S* on the number line.

i think how you would find point s would be to go and look and see the distance from point r because it said thtas the distence so i think the distence would be two places over.

> Numbers
> Arithmetic and Units
> Exponents and Roots
> Relations
> Geometry
> Groups

Points P, Q and R are shown on the number line.

Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.

> $0 - (-0.6) = 0.6$
> there is a distance of 0.6 between p and q
> $0.3 - 0 = 0.3$
> there is a distance of 0.3 between r and q

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.

> i counted how far away r is from q and got 3 tenths
> so i counted 3 tenths on the opposite sid of q. i got
> -0.3

Points P, Q and R are shown on the number line.

Part A

Find the distances between points P and Q and between points R and Q. Show your work or explain your answer. Refer to the number line in your explanation.
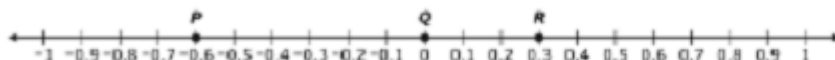
[toolbar: ↻ ↺ C ⌫ + − × ÷ ☰ ⊞ y^x √ = ≈]

The distance between point P and point Q is 0.6.

The distance between point R and point Q is 0.3.

▸ Numbers
▸ Arithmetic and Units
▸ Exponents and Roots
▸ Relations
▸ Geometry
▸ Groups

Part B

Point S is a different point on the number line. Point S and point R are the same distance from point Q. Explain how to determine the location of point S on the number line.
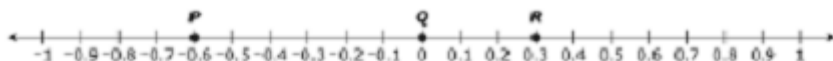
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You can determine the location of point S on the number line by figuring out the length of R to Q then go the same distance from R to Q the opposite way of R from Q and you will find where is should go.

▸ Numbers
▸ Arithmetic and Units
▸ Exponents and Roots
▸ Relations
▸ Geometry
▸ Groups

Points *P*, *Q* and *R* are shown on the number line.

Part A

Find the distances between points *P* and *Q* and between points *R* and *Q*. Show your work or explain your answer. Refer to the number line in your explanation.

read points between leters −6 is the distance between points p and q. the distance between r and q are 3.

> Numbers
> Arithmetic and Units
> Exponents and Roots
> Relations
> Geometry
> Groups

Part B

Point *S* is a different point on the number line. Point *S* and point *R* are the same distance from point *Q*. Explain how to determine the location of point *S* on the number line.

IT will be placed in −0.3 beacause r is 3 spaces from q.

> Numbers
> Arithmetic and Units
> Exponents and Roots
> Relations
> Geometry
> Groups

Practice Set

Paper	Score
P101	2,1
P102	0,0
P103	2,1
P104	1,1
P105	0,1