Chapter 11. Radical Expressions and Triangles

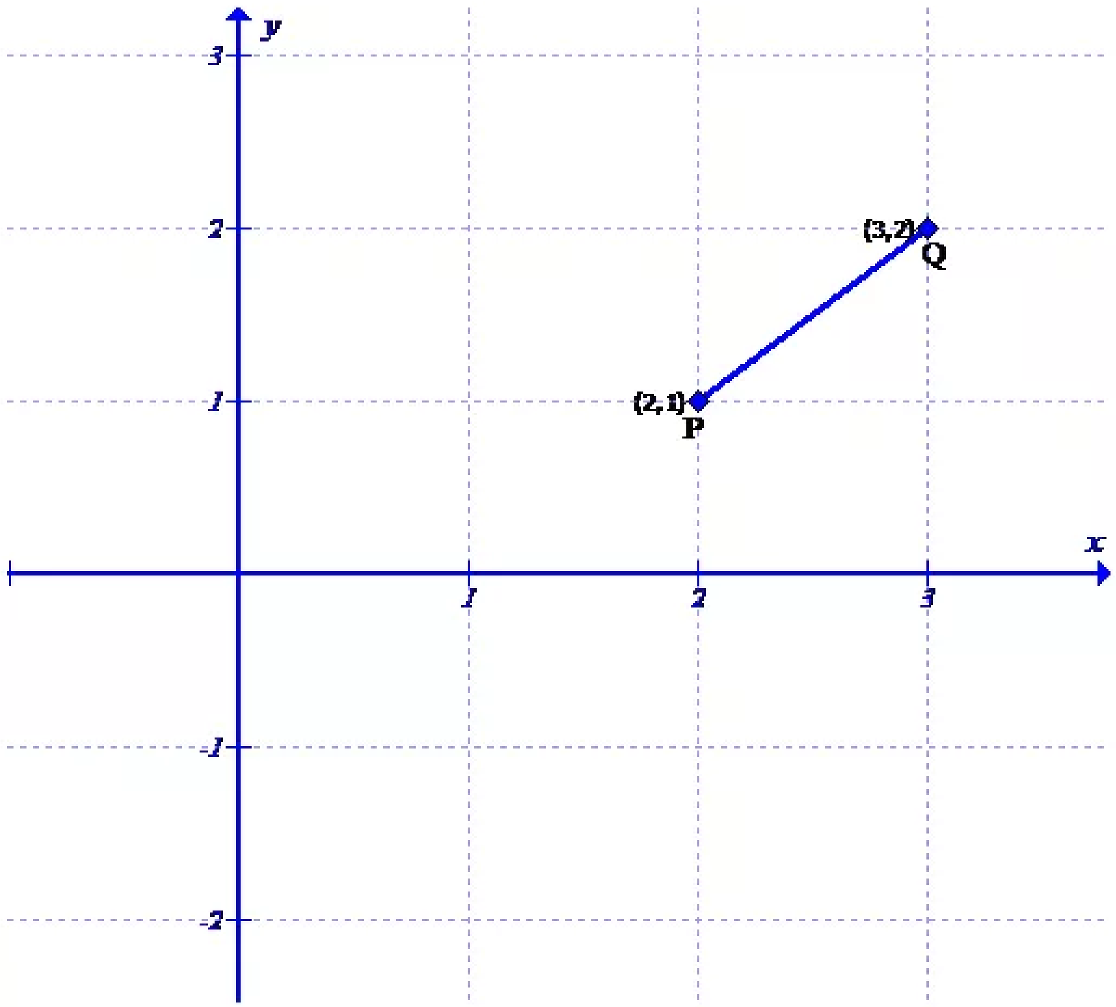
Ex. 11.5

Answer 1CU.

The value calculated under the radical sign can't be negative as it is measure distance by taking the square of the difference. Since the square of any real number is positive, therefore it can't be negative.

Answer 2CU.

Consider the figure:



The distance between the two points PQ will be:

$$\begin{aligned} PQ &= \sqrt{(3-2)^2 + (2-1)^2} \\ &= \sqrt{1^2 + 1^2} \\ &= \sqrt{2} \end{aligned}$$

Again find the length of QP as follows

$$\begin{aligned} QP &= \sqrt{(2-3)^2 + (1-2)^2} \\ &= \sqrt{(-1)^2 + (-1)^2} \\ &= \sqrt{2} \end{aligned}$$

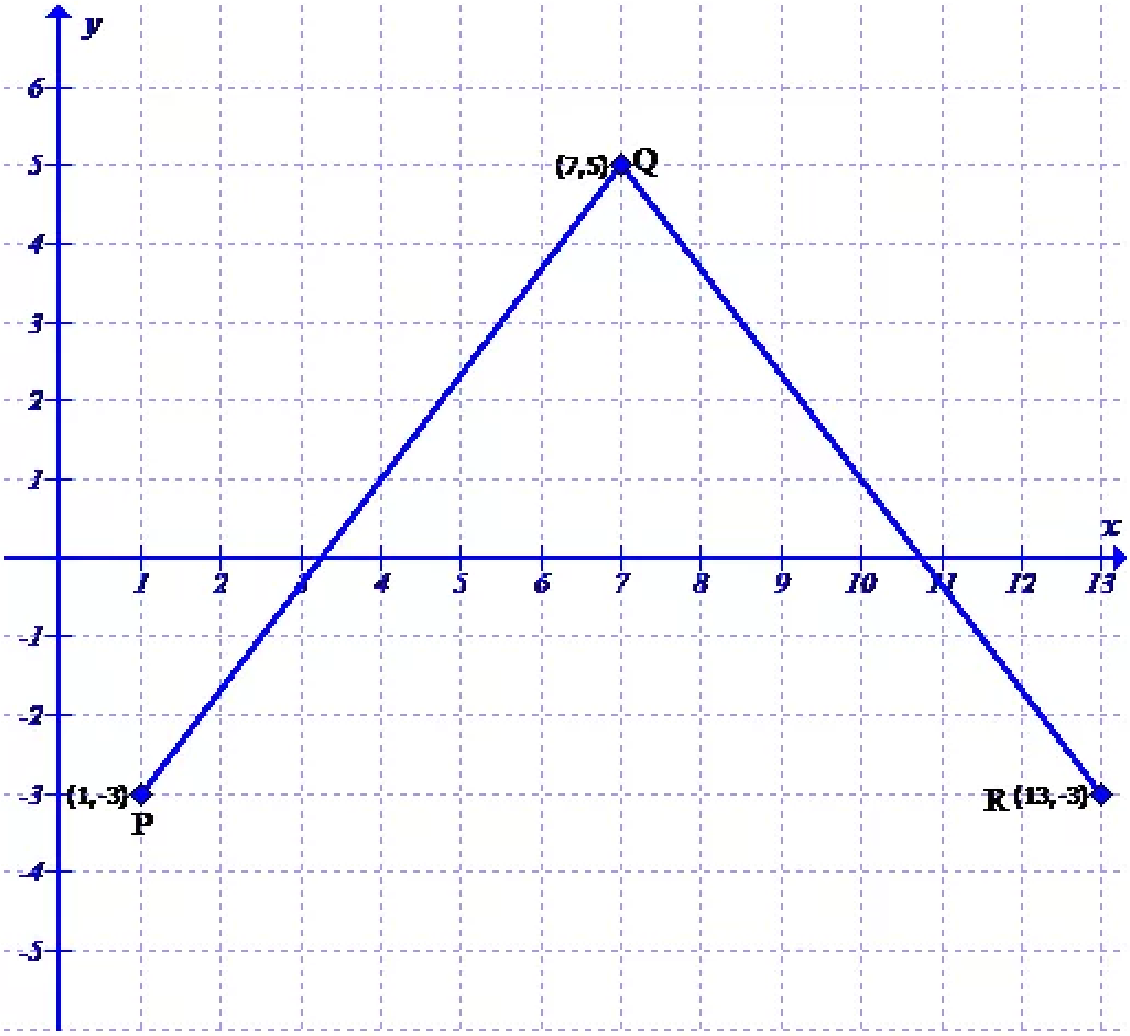
Therefore there is no matter which ordered pair we use to determine the distance between the points.

Q3CU.

In example 3 it is given that the points $(7,5)$ and $(a,-3)$ has the distance 10 unit.

The values of *a* are 1 and 13 respectively.

Now plot the points on the *xy*-plane as follows:



The distance between the two points *PQ* will be:

$$PQ = \sqrt{(7-1)^2 + (5-(-3))^2}$$
$$= \sqrt{6^2 + 8^2}$$
$$= 10$$

Again find the length of *PR* as follows

$$QR = \sqrt{(7-13)^2 + (5-(-3))^2}$$
$$= \sqrt{(-6)^2 + 8^2}$$
$$= 10$$

Therefore the two distances are equal.

Answer 4CU.

Consider the two points:

$$(5,-1),(11,7)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(11-5)^2+(7-(-1))^2} \\ &= \sqrt{6^2+8^2} \\ &= \sqrt{100} \\ d &= \boxed{10} \end{aligned}$$

Answer 5CU.

Consider the two points:

$$(3,7),(2,5)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(-2-3)^2+(-5-3)^2} \\ &= \sqrt{(-5)^2+(-8)^2} \\ &= \sqrt{25+64} \\ d &\approx \boxed{9.43} \qquad \text{Rounding to the nearest hundredth} \end{aligned}$$

Answer 6CU.

Consider the two points:

$$(2,2),(5,-1)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(5-2)^2+(-1-2)^2} \\ &= \sqrt{3^2+(-3)^2} \\ &= \sqrt{18} \\ d &\approx \boxed{4.24} \qquad \text{Rounding to the nearest hundredth} \end{aligned}$$

Answer 7CU.

Consider the two points:

$$(-3,-5),(-6,-4)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(-6-(-3))^2+(-4-(-5))^2} \\ &= \sqrt{(-3)^2+1^2} \\ &= \sqrt{10} \\ d &\approx \boxed{3{,}16} \quad \text{Rounding to the nearest hundredth} \end{aligned}$$

Answer 8CU.

Consider the two points:

$$(3,-1),(a,7);d=10$$

Therefore the distance between the two points will be:

$$\begin{aligned} \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} &= d \\ \sqrt{(a-3)^2+(7-(-1))^2} &= 10 \\ (a-3)^2+8^2 &= 100 \\ a^2-6a+9+64 &= 100 \\ a^2-6a+73-100 &= 0 \\ a^2-6a-27 &= 0 \\ (a-9)(a+3) &= 0 \\ a &= 9,-3 \end{aligned}$$

Therefore the values of a are $\boxed{9,-3}$.

Answer 9CU.

Consider the two points:

$$(10,a),(1,-6);d=\sqrt{145}$$

Therefore the distance between the two points will be:

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=d$$
$$\sqrt{(1-10)^2+(-6-a)^2}=\sqrt{145}$$
$$9^2+(a+6)^2=145$$
$$81+a^2+12a+36-145=0$$
$$a^2+12a-28=0$$
$$a^2+14a-2a-28=0$$
$$(a+14)(a-2)=0$$
$$a=-14,2$$

Therefore the values of *a* are $\boxed{-14,2}$.

Answer 10CU.

Consider the vertices of the isosceles triangle are:

$$A(-3,4),B(5,2)\text{ and }C(-1,-5)$$

Now the distance between the point *A* and *B* will be:

$$AB=\sqrt{(5-(-3))^2+(2-4)^2}$$
$$=\sqrt{8^2+(-2)^2}$$
$$=\sqrt{68}$$
$$=2\sqrt{17}$$

The distance between the point *A* and *C* will be:

$$AC=\sqrt{(-1-(-3))^2+(-5-4)^2}$$
$$=\sqrt{2^2+(-9)^2}$$
$$=\sqrt{85}$$

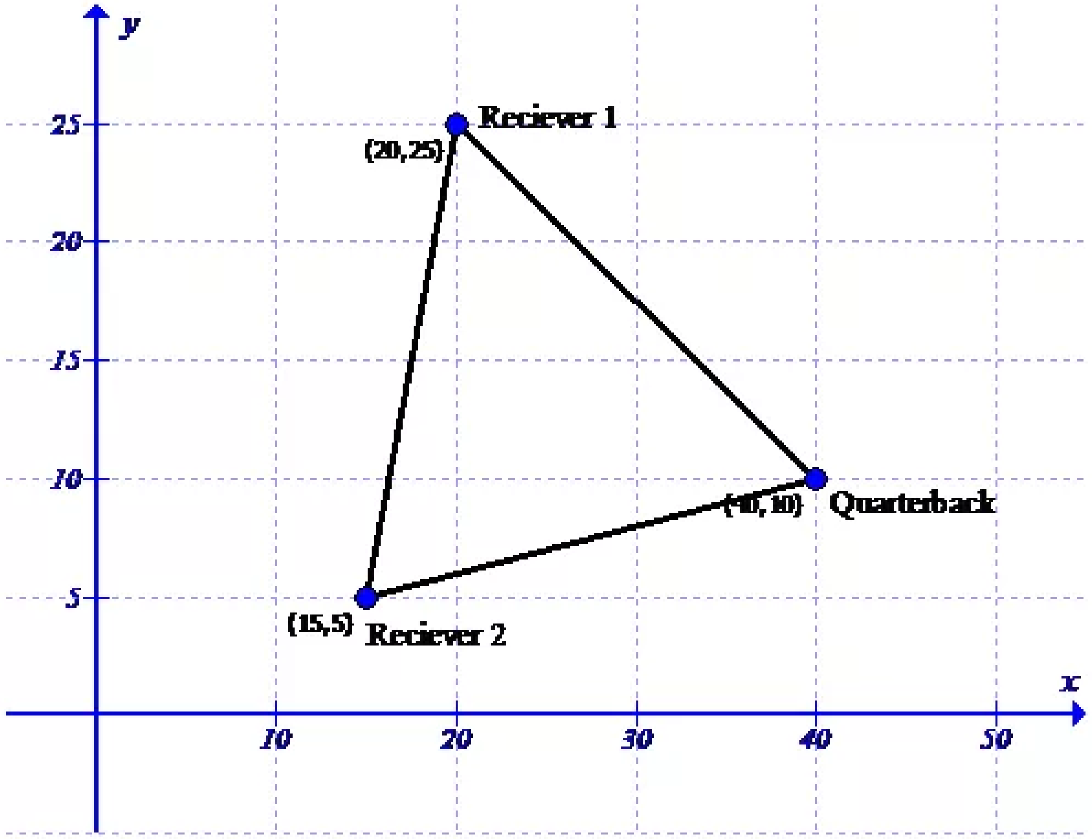
The distance between the point *B* and *C* will be:

$$BC=\sqrt{(-1-5)^2+(-5-2)^2}$$
$$=\sqrt{(-6)^2+(-7)^2}$$
$$=\sqrt{85}$$

Since $AC=BC$, therefore *ABC* is an isosceles triangle.

Answer 11CU.

Consider the figure:



The distance between the quarterback and the receiver 1 is:

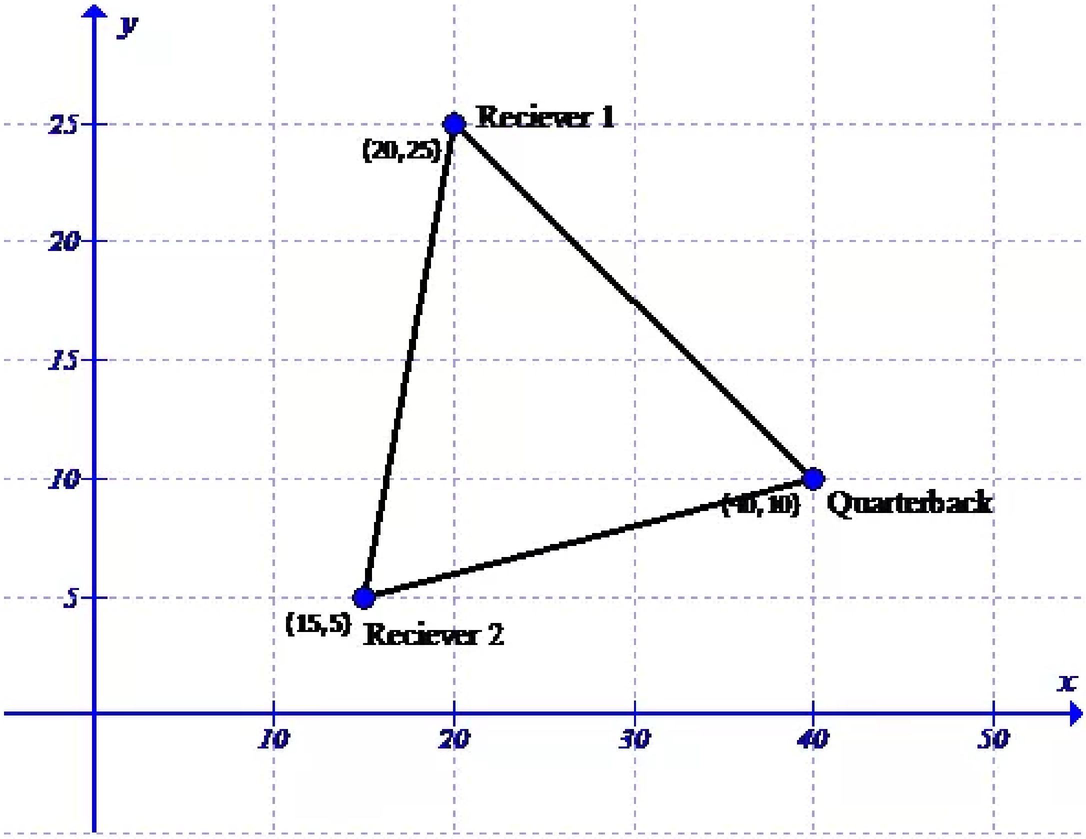
$$\begin{aligned}d_1 &= \sqrt{(40-20)^2+(10-25)^2}\\ &= \sqrt{20^2+(-15)^2}\\ &= \sqrt{400+225}\\ &= \boxed{25 \text{ unit}}\end{aligned}$$

And the distance between the quarterback and the receiver 2 is:

$$\begin{aligned}d_2 &= \sqrt{(40-15)^2+(10-5)^2}\\ &= \sqrt{25^2+5^2}\\ &= \sqrt{635+25}\\ &= \boxed{25.69 \text{ unit}}\end{aligned}$$

Answer 12CU.

Consider the figure:



The distance between the receiver 1 and the receiver 2 is:

$$
\begin{aligned}
d_1 &= \sqrt{(20-15)^2+(25-5)^2} \\
&= \sqrt{5^2+20^2} \\
&= \sqrt{25+400} \\
&= \boxed{20.61 \text{ unit}}
\end{aligned}
$$

Answer 13PA.

Consider the two points:

$$(12,3),(-8,3)$$

Therefore the distance between the two points will be:

$$
\begin{aligned}
d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\
&= \sqrt{(-8-12)^2+(3-3)^2} \\
&= \sqrt{(-20)^2+0^2} \\
&= \sqrt{400} \\
d &= \boxed{20}
\end{aligned}
$$

Answer 14PA.

Consider the two points:

$$(0,0),(5,12)$$

Therefore the distance between the two points will be:

$$\begin{aligned}d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}\\ &= \sqrt{(5-0)^2+(12-0)^2}\\ &= \sqrt{5^2+12^2}\\ &= \sqrt{169}\\ d &= \boxed{13}\end{aligned}$$

Answer 15PA.

Consider the two points:

$$(6,8),(3,4)$$

Therefore the distance between the two points will be:

$$\begin{aligned}d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}\\ &= \sqrt{(3-6)^2+(4-8)^2}\\ &= \sqrt{(-3)^2+(-4)^2}\\ &= \sqrt{25}\\ d &= \boxed{5}\end{aligned}$$

Answer 16PA.

Consider the two points:

$$(-4,2),(4,17)$$

Therefore the distance between the two points will be:

$$\begin{aligned}d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}\\ &= \sqrt{(4-(-4))^2+(17-2)^2}\\ &= \sqrt{8^2+15^2}\\ &= \sqrt{289}\\ d &= \boxed{17}\end{aligned}$$

Answer 17PA.

Consider the two points:

$$(-3,8),(5,4)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(5-(-3))^2+(4-8)^2} \\ &= \sqrt{8^2+(-4)^2} \\ &= \sqrt{80} \\ d &\approx \boxed{8.94} \quad \text{Round to the nearest hundredth} \end{aligned}$$

Answer 18PA.

Consider the two points:

$$(9,-2),(3,-6)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(3-9)^2+(-6-(-2))^2} \\ &= \sqrt{(-6)^2+4^2} \\ &= \sqrt{52} \\ d &\approx \boxed{7.21} \quad \text{Round to the nearest hundredth} \end{aligned}$$

Answer 19PA.

Consider the two points:

$$(-8,-4),(-3,-8)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(-3-(-8))^2+(-8-(-4))^2} \\ &= \sqrt{5^2+(-4)^2} \\ &= \sqrt{41} \\ d &\approx \boxed{6.40} \quad \text{Round to the nearest hundredth} \end{aligned}$$

Answer 20PA.

Consider the two points:

$$(2,7),(10,-4)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(10-2)^2+(-4-7)^2} \\ &= \sqrt{8^2+(-11)^2} \\ &= \sqrt{185} \\ d &\approx \boxed{13.60} \qquad \text{Round to the nearest hundredth} \end{aligned}$$

Answer 21PA.

Consider the two points:

$$(4,2),\left(6,-\frac{2}{3}\right)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(6-4)^2+\left(-\frac{2}{3}-2\right)^2} \\ &= \sqrt{2^2+\left(-\frac{8}{3}\right)^2} \\ &= \sqrt{4+\frac{64}{9}} \\ &= \sqrt{\frac{100}{9}} \\ &= \frac{10}{3} \\ d &\approx \boxed{3.33} \qquad \text{Round to the nearest hundredth} \end{aligned}$$

Answer 22PA.

Consider the two points:

$$\left(5,\frac{1}{4}\right),(3,4)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(3-5)^2+\left(4-\frac{1}{4}\right)^2} \\ &= \sqrt{2^2+\left(\frac{15}{4}\right)^2} \\ &= \sqrt{4+\frac{225}{16}} \\ &= \sqrt{\frac{289}{16}} \\ &= \frac{17}{4} \\ d &\approx \boxed{4.25} \quad \text{Round to the nearest hundredth} \end{aligned}$$

Answer 23PA.

Consider the two points:

$$\left(\frac{5}{4},-1\right),\left(2,-\frac{1}{2}\right)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{\left(2-\frac{4}{5}\right)^2+\left(-\frac{1}{2}-(-1)\right)^2} \\ &= \sqrt{\left(\frac{6}{5}\right)^2+\left(\frac{1}{2}\right)^2} \\ &= \sqrt{\frac{36}{25}+\frac{1}{4}} \\ &= \sqrt{\frac{144+25}{100}} \\ &= \frac{13}{10} \\ d &\approx \boxed{1.3} \end{aligned}$$

Answer 24PA.

Consider the two points:

$$\left(3,\frac{3}{7}\right),\left(4,-\frac{2}{7}\right)$$

Therefore the distance between the two points will be:

$$\begin{aligned}
d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\
&= \sqrt{(4-3)^2+\left(-\frac{2}{7}-\frac{3}{7}\right)^2} \\
&= \sqrt{1^2+\left(-\frac{5}{7}\right)^2} \\
&= \sqrt{1+\frac{25}{49}} \\
&= \sqrt{\frac{49+25}{49}} \\
&= \frac{\sqrt{74}}{7} \\
d &\approx \boxed{1.23}
\end{aligned}$$

Answer 25PA.

Consider the two points:

$$\left(4\sqrt{5},7\right),\left(6\sqrt{5},1\right)$$

Therefore the distance between the two points will be:

$$\begin{aligned}
d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\
&= \sqrt{\left(6\sqrt{5}-4\sqrt{5}\right)^2+(1-7)^2} \\
&= \sqrt{\left(2\sqrt{5}\right)^2+(-6)^2} \\
&= \sqrt{20+36} \\
&= \sqrt{56} \\
d &\approx \boxed{7.48}
\end{aligned}$$

Answer 26PA.

Consider the two points:

$$\left(5\sqrt{2},8\right),\left(7\sqrt{2},10\right)$$

Therefore the distance between the two points will be:

$$\begin{aligned}
d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\
&= \sqrt{\left(7\sqrt{2}-5\sqrt{2}\right)^2+(10-8)^2} \\
&= \sqrt{\left(2\sqrt{2}\right)^2+2^2} \\
&= \sqrt{8+4} \\
&= \sqrt{12} \\
d &\approx \boxed{3.46}
\end{aligned}$$

Answer 27PA.

Consider the two points:

$$(4,-7),(a,3);d=5$$

Therefore the distance between the two points will be:

$$\begin{aligned}
\sqrt{(x_2-x_1)^2+(y_2-y_1)^2} &= d \\
\sqrt{(a-4)^2+(3-7)^2} &= 5 \\
(a-4)^2+(-4)^2 &= 25 \\
a^2-8a+16+16-25 &= 0 \\
a^2-8a+32-25 &= 0 \\
a^2-8a+7 &= 0 \\
(a-1)(a-7) &= 0 \\
a &= 1,7
\end{aligned}$$

Therefore the values of *a* are $\boxed{1,7}$.

Answer 28PA.

Consider the two points:

$$(-4,a),(4,2);d=17$$

Therefore the distance between the two points will be:

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=d$$
$$\sqrt{(4-(-4))^2+(2-a)^2}=17$$
$$8^2+(2-a)^2=289$$
$$64+4-4a+a^2-289=0$$
$$a^2-4a-289+68=0$$
$$a^2-4a-221=0$$
$$(a-17)(a+13)=0$$
$$a=17,-13$$

Therefore the values of *a* are $\boxed{17,-13}$.

Answer 29PA.

Consider the two points:

$$(5,a),(6,1);d=\sqrt{10}$$

Therefore the distance between the two points will be:

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=d$$
$$\sqrt{(6-5)^2+(1-a)^2}=\sqrt{10}$$
$$1^2+(1-a)^2=10$$
$$1+1-2a+a^2-10=0$$
$$a^2-2a-10+1=0$$
$$a^2-2a-8=0$$
$$(a-4)(a+2)=0$$
$$a=4,-2$$

Therefore the values of *a* are $\boxed{4,-2}$.

Answer 30PA.

Consider the two points:

$$(a,5),(-7,3);d=\sqrt{29}$$

Therefore the distance between the two points will be:

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=d$$
$$\sqrt{(-7-a)^2+(3-5)^2}=\sqrt{29}$$
$$(a+7)^2+(-2)^2=29$$
$$a^2+14a+49+4-29=0$$
$$a^2+14a+53-29=0$$
$$a^2+14a+24=0$$
$$(a+12)(a+2)=0$$
$$a=-12,-2$$

Therefore the values of *a* are $\boxed{-12,-2}$.

Answer 31PA.

Consider the two points:

$$(6,-3),(-3,a);d=\sqrt{130}$$

Therefore the distance between the two points will be:

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=d$$
$$\sqrt{(-3-6)^2+(a+3)^2}=\sqrt{130}$$
$$(-9)^2+(a+3)^2=130$$
$$81+a^2+6a+9-130=0$$
$$a^2+6a-40=0$$
$$a^2+10a-4a-40=0$$
$$(a+10)(a-4)=0$$
$$a=-10,4$$

Therefore the values of *a* are $\boxed{-10,4}$.

Answer 32PA.

Consider the two points:

$$(20,5),(a,9);d=\sqrt{340}$$

Therefore the distance between the two points will be:

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=d$$
$$\sqrt{(a-20)^2+(9-4)^2}=\sqrt{340}$$
$$(a-9)^2+5^2=340$$
$$a^2-18a+81+25-340=0$$
$$a^2-18a-235=0$$
$$a=\frac{18\pm\sqrt{18^2-4(-235)}}{2}$$
$$=\frac{18\pm\sqrt{1264}}{2}$$
$$a=26.77,-8.78$$

Therefore the values of *a* are $\boxed{26.77,-8.78}$.

Answer 33PA.

Consider the vertices of the triangle:

$$A(7,-4),B(-1,2)\text{ and }C(5,-6)$$

Now the distance between the point *A* and *B* will be:

$$AB=\sqrt{(-1-7)^2+(2-(-4))^2}$$
$$=\sqrt{(-8)^2+6^2}$$
$$=\sqrt{100}$$
$$=10$$

The distance between the point *A* and *C* will be:

$$AC=\sqrt{(5-7)^2+(-6-(-4))^2}$$
$$=\sqrt{(-2)^2+(-2)^2}$$
$$=\sqrt{8}$$
$$=2\sqrt{2}$$

The distance between the point *B* and *C* will be:

$$BC=\sqrt{(5-(-1))^2+(-6-2)^2}$$
$$=\sqrt{6^2+(-8)^2}$$
$$=\sqrt{100}$$
$$=10$$

Since $AB=BC$, therefore triangle *ABC* has two sides equal.

Answer 34PA.

Consider the vertices of the trapezoids are:

$$A(-2,2), B(10,6), C(9,8) \text{ and } D(0,5)$$

Since *ABCD* is a trapezoid, therefore *AC* and *BD* are the diagonals of the trapezoid.

Now the distance between the point *A* and *C* will be:

$$\begin{aligned} AC &= \sqrt{(9-(-2))^2+(8-2)^2} \\ &= \sqrt{11^2+6^2} \\ &= \sqrt{157} \end{aligned}$$

The distance between the point *B* and *D* will be:

$$\begin{aligned} BD &= \sqrt{(0-10)^2+(5-6)^2} \\ &= \sqrt{(-10)^2+(-1)^2} \\ &= \sqrt{101} \end{aligned}$$

Since $AC \neq BD$, therefore the trapezoid *ABCD* is **not an isosceles trapezoid**.

Answer 35PA.

Consider the points:

$$L(-4,-3), M(2,5), N(-13,10) \text{ and } P(x,-2)$$

It is given that the distance between *PL* and *PM* is same.

Therefore

$$\sqrt{(x-(-4))^2+(-2-(-3))^2} = \sqrt{(x-2)^2+(-2-5)^2}$$

$$(x+4)^2+1^2 = (x-2)^2+(-7)^2$$

$$x^2+8x+16+1 = x^2-4x+4+49$$

$$8x+4x = 53-17 \qquad \text{Isolating the variables}$$

$$\begin{aligned} 12x &= 36 \\ x &= \frac{36}{12} \qquad \text{Divide both sides by 12} \\ &= 3 \end{aligned}$$

Thus the value of *x* is: $\boxed{3}$

Answer 36PA.

Consider the points:

$Q(1,7), R(3,1), S(9,3)$ and $\mathrm{T}(7,d)$

It is given that the distance between *QR* and *ST* is same.

Therefore

$$\begin{aligned}
\sqrt{(3-1)^2+(1-7)^2} &= \sqrt{(7-9)^2+(d-3)^2} \\
2^2+(-6)^2 &= (-2)^2+(d-3)^2 \\
4+36 &= 4+(d-3)^2 \\
(d-3)^2 &= 36 \qquad \text{Simplifying}
\end{aligned}$$

$$\begin{aligned}
d-3 &= \pm 6 \qquad \text{Take squareroot to both sides} \\
d &= 3 \pm 6 \qquad \text{Add 3 to both sides} \\
&= 9, -3
\end{aligned}$$

Thus the values of *d* are $\boxed{d = 9, -3}$.

Answer 37PA.

Consider the location of the two points:

$P(132,428)$ and $Q(254,105)$

Now the distance between the two points is:

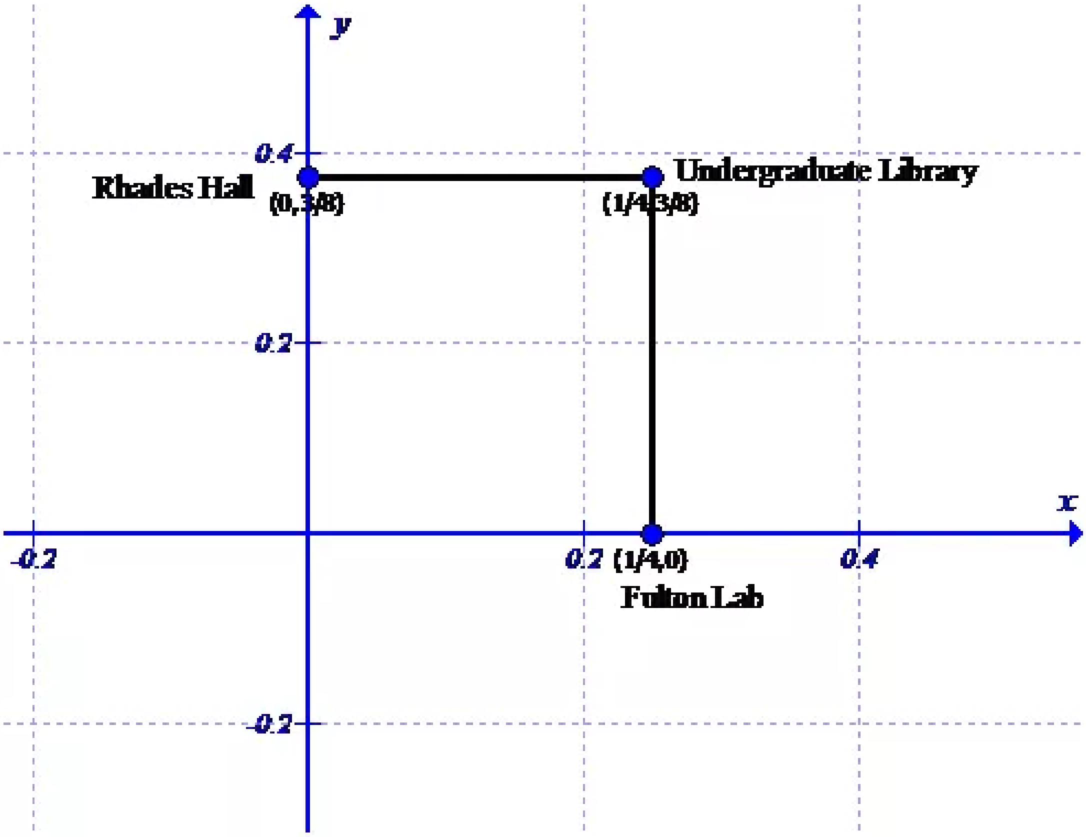
$$\begin{aligned}
PQ &= \sqrt{(254-132)^2+(105-428)^2} \\
&= \sqrt{(122)^2+(-323)^2} \\
&= \sqrt{119213} \\
&= 345.27 \text{ unit}
\end{aligned}$$

Thus the actual distance between the two airports in miles is:

$$\begin{aligned}
d &= 0.316 \times 345.27 \text{ miles} \\
&= \boxed{109 \text{ miles}}
\end{aligned}$$

Answer 38PA.

Consider the figure:



The distance between the *Rhades Hall* and *Fulton Lab* will be given by distance between the point $\left(0,\frac{1}{8}\right)$ and $\left(\frac{1}{4},0\right)$.

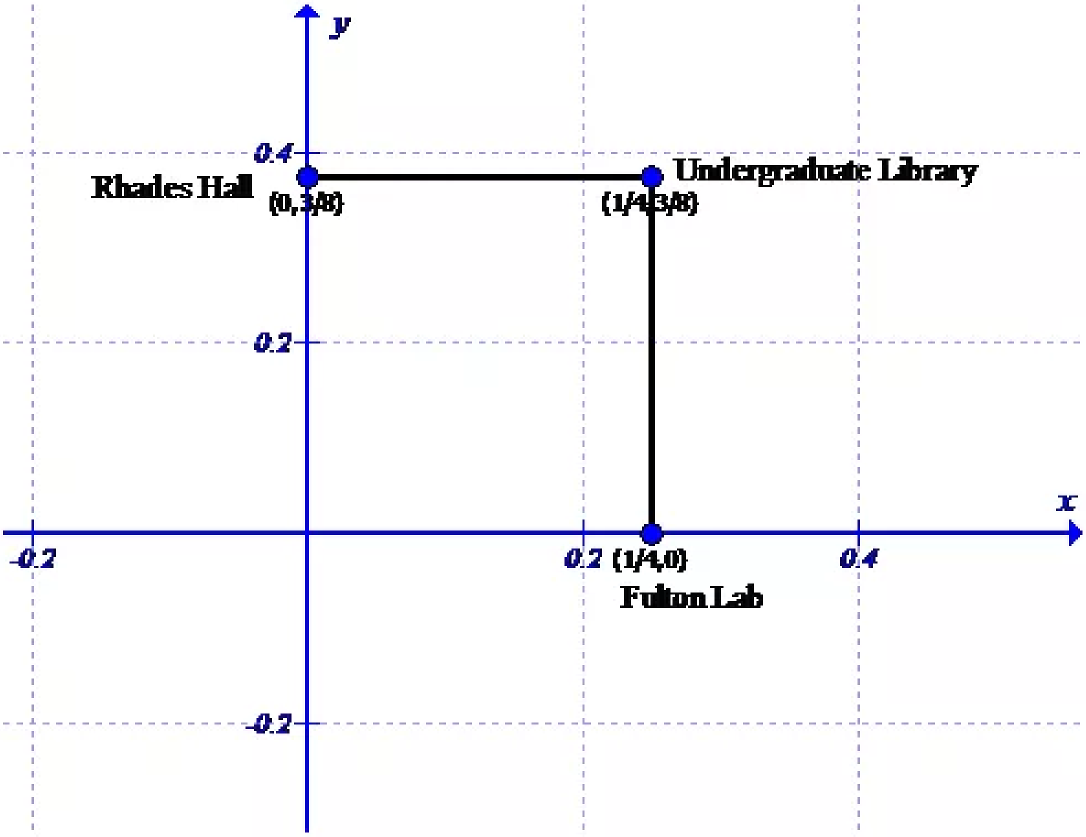
Thus the distance between the *Rhades Hall* and *Fulton Lab* will be:

$$\begin{aligned} d &= \sqrt{\left(\frac{1}{4}-0\right)^2+\left(0-\frac{1}{8}\right)^2} \\ &= \sqrt{\frac{1}{16}+\frac{1}{64}} \\ &= \sqrt{\frac{5}{64}} \\ &= \frac{\sqrt{5}}{8} \end{aligned}$$

$$d \approx \boxed{0.28 \text{ mi}}$$

Answer 39PA.

Consider the figure:



The distance between the *Rhades Hall* and *Fulton Lab* will be given by distance between the point $\left(0,\frac{1}{8}\right)$ and $\left(\frac{1}{4},0\right)$.

Thus the distance between the *Rhades Hall* and *Fulton Lab* will be:

$$d=\sqrt{\left(\frac{1}{4}-0\right)^2+\left(0-\frac{1}{8}\right)^2}$$

$$=\sqrt{\frac{1}{16}+\frac{1}{64}}$$

$$=\sqrt{\frac{5}{64}}$$

$$=\frac{\sqrt{5}}{8}$$

$$d\approx 0.28\text{ mi}$$

Now it is given that she has walked with the speed 3 mi per hour.

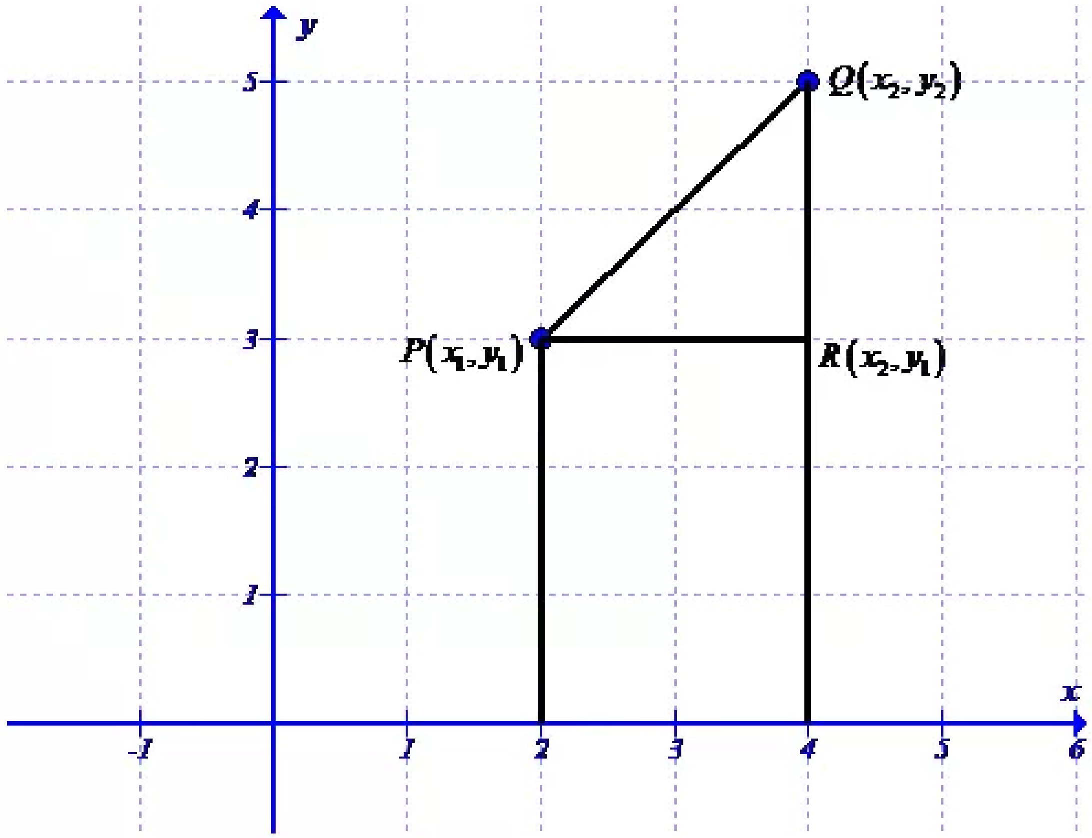
Therefore time required to complete a distance of 0.28 mi is:

$$t = \frac{0.28}{3} \text{ hr}$$
$$= \frac{0.28}{3} \times 60 \text{ min}$$
$$= 5.6 \text{ min}$$

Since the time gap between two classes is 12 min. Therefore she can attend the class on time.

Answer 44PA.

Consider two points $P(x_1, y_1)$ and $Q(x_2, y_2)$. The points are plotted on the *xy*-plane as shown below:



From the figure it can be verified that *PQR* is a right triangle.

The distance between *PR* is: $x_2 - x_1$ and the distance between *QR* is $y_2 - y_1$.

Since *PQR* is a right triangle, therefore

$$PQ^2 = PR^2 + QR^2$$
$$= (x_2 - x_1)^2 + (y_2 - y_1)^2$$
$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Which is can be used to find the distance between any two points.

While calculating the length between $P(-24,18)$ and $Q(-24,10)$ it is no need of distance formula as the *x*-coordinates are same. In this case the distance between *y*-coordinates will give the distance of the two points.

Answer 45PA.

Consider the two points:

$$(6,11),(-2,-4)$$

Therefore the distance between the two points will be:

$$\begin{aligned} d &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(-2-6)^2+(-4-11)^2} \\ &= \sqrt{(-8)^2+(-15)^2} \\ &= \sqrt{64+225} \\ &= \sqrt{289} \\ d &= 17 \end{aligned}$$

Therefore the correct option is: $\boxed{\text{(B)}}$

Answer 46PA.

Consider the two points of the square:

$$A(3,7),B(-3,4)$$

Therefore the distance between the two points will be:

$$\begin{aligned} AB &= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \\ &= \sqrt{(-3-3)^2+(4-7)^2} \\ &= \sqrt{(-6)^2+(-3)^2} \\ &= \sqrt{36+9} \\ &= \sqrt{45} \\ AB &= 3\sqrt{5} \end{aligned}$$

Thus the perimeter of the square will be: $P=4\times3\sqrt{5}$ or $12\sqrt{5}$

Therefore the correct option is: $\boxed{\text{(B)}}$

Answer 47MYS.

Consider the measure of the right angles:

$$a=7, b=24 \text{ and } c=?$$

Since c is the hypotenuse of the right triangle, therefore

$$\begin{aligned} c^2 &= a^2+b^2 \\ &= 7^2+24^2 \\ &= 49+576 \\ &= 625 \end{aligned}$$

$$\begin{aligned} c &= \sqrt{625} \qquad \text{Taking squareroot to both sides} \\ &= \boxed{25} \end{aligned}$$

Answer 48MYS.

Consider the measure of the right angles:

$a = ?, b = 30 \text{ and } c = 34$

Since *c* is the hypotenuse of the right triangle, therefore

$$\begin{aligned} c^2 &= a^2 + b^2 \\ 34^2 &= a^2 + 30^2 \\ a^2 &= 1156 - 900 \\ a^2 &= 256 \\ a &= \sqrt{256} \qquad \text{Taking squareroot to both sides} \\ &= \boxed{16} \end{aligned}$$

Answer 49MYS.

Consider the measure of the right angles:

$a = \sqrt{7}, b = ? \text{ and } c = \sqrt{16}$

Since *c* is the hypotenuse of the right triangle, therefore

$$\begin{aligned} c^2 &= a^2 + b^2 \\ \left(\sqrt{16}\right)^2 &= \left(\sqrt{7}\right)^2 + b^2 \\ b^2 &= 16 - 7 \\ b^2 &= 9 \\ b &= \sqrt{9} \qquad \text{Taking squareroot to both sides} \\ &= \boxed{3} \end{aligned}$$

Answer 50MYS.

Consider the measure of the right angles:

$a = \sqrt{13}, b = \sqrt{50} \text{ and } c = ?$

Since *c* is the hypotenuse of the right triangle, therefore

$$\begin{aligned} c^2 &= a^2 + b^2 \\ &= \left(\sqrt{13}\right)^2 + \left(\sqrt{50}\right)^2 \\ &= 13 + 50 \\ &= 63 \\ c &= \sqrt{63} \qquad \text{Taking squareroot to both sides} \\ &\approx \boxed{7.93} \qquad \text{Rounding to nearest hundredth} \end{aligned}$$

Answer 51MYS.

Consider the equation:

$$\sqrt{p-2}+8=p$$

Now solve the equation for *p* as follows:

$$\sqrt{p-2}+8=p$$

$$\sqrt{p-2}=p-8 \qquad \text{Subtract 8 from both sides}$$

$$\left(\sqrt{p-2}\right)^2=(p-8)^2$$

$$p-2=p^2-16p+64$$

$$p^2-16p+64-p+2=0 \qquad \text{Subtract } (p-2) \text{ from both sides}$$

$$p^2-17p+66=0$$

$$(p-11)(p-6)=0$$

$$p=11,6$$

Check the solution $p=11$

$$\sqrt{11-2}+8 \overset{?}{=} 11$$

$$3+8 \overset{?}{=} 11$$

$$11=11$$

Again check for $p=6$

$$\sqrt{6-2}+8 \overset{?}{=} 6$$

$$2+8 \overset{?}{=} 6$$

$$10 \neq 6$$

There the solution to the equation is: $\boxed{p=11}$

Answer 52MYS.

Consider the equation:

$$\sqrt{r+5} = r-1$$

Now solve the equation for *p* as follows:

$$\begin{aligned} \sqrt{r+5} &= r-1 \\ \left(\sqrt{r+5}\right)^2 &= (r-1)^2 \\ r+5 &= r^2-2r+1 \\ r^2-2r+1-r-5 &= 0 \\ r^2-3r-4 &= 0 \\ (r-4)(r+1) &= 0 \\ r &= 4,-1 \end{aligned}$$

Check the solution $r=4$

$$\sqrt{4+5} \stackrel{?}{=} 4-1$$
$$3 = 3$$

Again check for $r=-1$

$$\sqrt{-1+5} \stackrel{?}{=} -1-1$$
$$2 = -2 \qquad \text{False}$$

There the solution to the equation is: $\boxed{r=4}$.

Answer 53MYS.

Consider the equation:

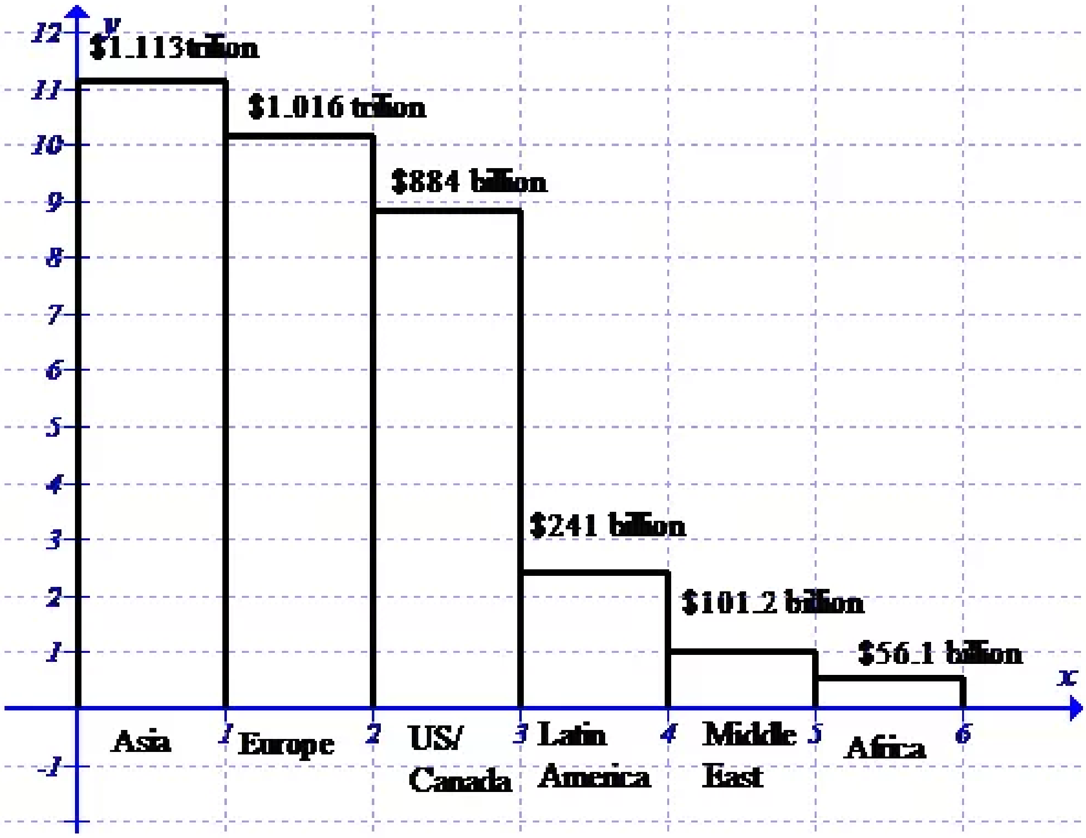
$$\sqrt{5t^2+29} = 2t+3$$

Now solve the equation for *p* as follows:

$$\begin{aligned} \sqrt{5t^2+29} &= 2t+3 \\ \left(\sqrt{5t^2+29}\right)^2 &= (2t+3)^2 \\ 5t^2+29 &= 4t^2+12t+9 \\ 5t^2+29-4t^2-12t-9 &= 0 \\ t^2-12t+20 &= 0 \\ (t-10)(t-2) &= 0 \\ t &= 10,2 \end{aligned}$$

Answer 54MYS.

Consider the graph that shows the construction:

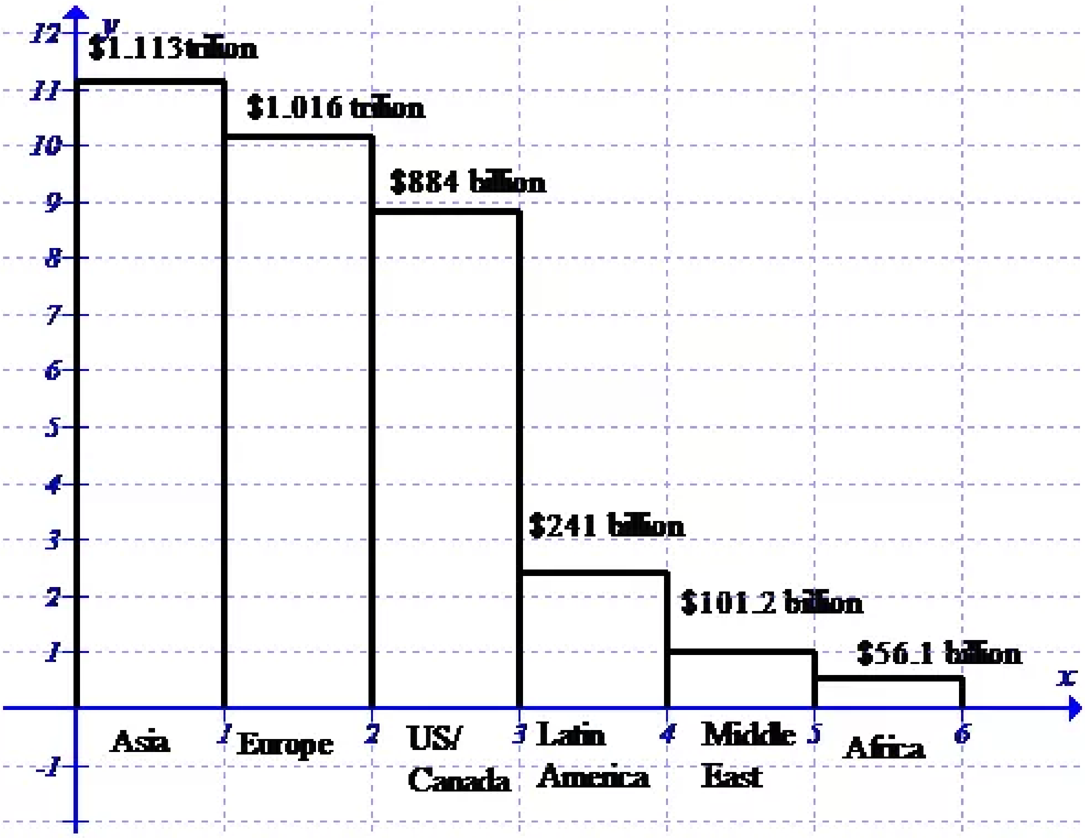


The value for continent or region can be listed in standard notation as follows:

$$\begin{aligned}
\$1.113 \text{ trilion} &= \$1{,}113{,}000{,}000{,}000 \\
\$1.016 \text{ trilion} &= \$1{,}016{,}000{,}000{,}000 \\
\$884 \text{ billion} &= \$884{,}000{,}000{,}000 \\
\$241 \text{ billion} &= \$241{,}000{,}000{,}000 \\
\$101.2 \text{ billion} &= \$101{,}200{,}000{,}000 \\
\$56.1 \text{ billion} &= \$56{,}100{,}000{,}000
\end{aligned}$$

Answer 55MYS.

Consider the graph that shows the construction:

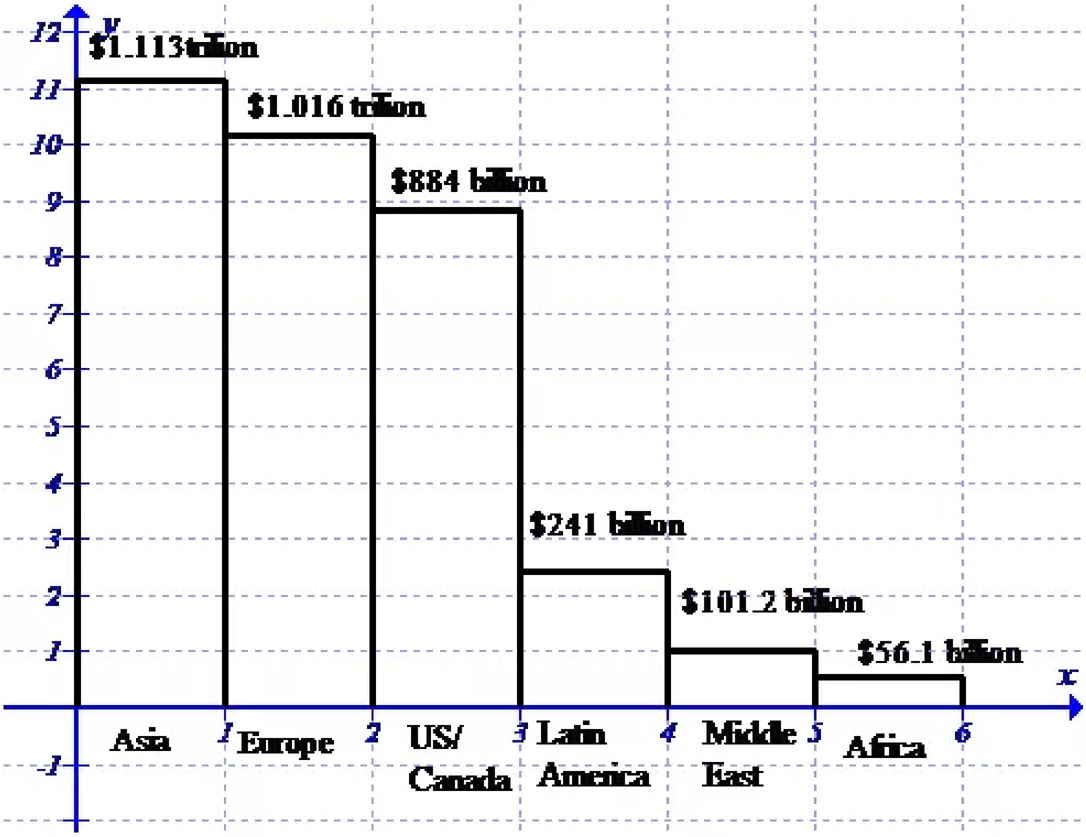


The value for continent or region can be listed in standard notation as follows:

$$\$1.113 \text{ trilion} = \$1.113\times10^{12}$$
$$\$1.016 \text{ trilion} = \$1.016\times10^{12}$$
$$\$884 \text{ billion} = \$8.84\times10^{11}$$
$$\$241 \text{ billion} = \$2.41\times10^{11}$$
$$\$101.2 \text{ billion} = \$1.012\times10^{11}$$
$$\$56.1 \text{ billion} = \$5.61\times10^{11}$$

Answer 56MYS.

Consider the graph that shows the construction:



From the given graph it can be observed that the money used in Asia is \$1.113 trillion and in Latin America is \$241 billion.

Thus the amount invested in Asia compare to Latin America is:

$$(\$1113 - \$241) \text{ billion} = \boxed{\$872 \text{ billion}}$$

Answer 57MYS.

Consider the inequality:

$$8 \le m - 1$$

To solve the inequality follows the steps:

$$\begin{aligned} 8 &\le m - 1 \\ 8 + 1 &\le m - 1 + 1 \\ 9 &\le m \end{aligned}$$

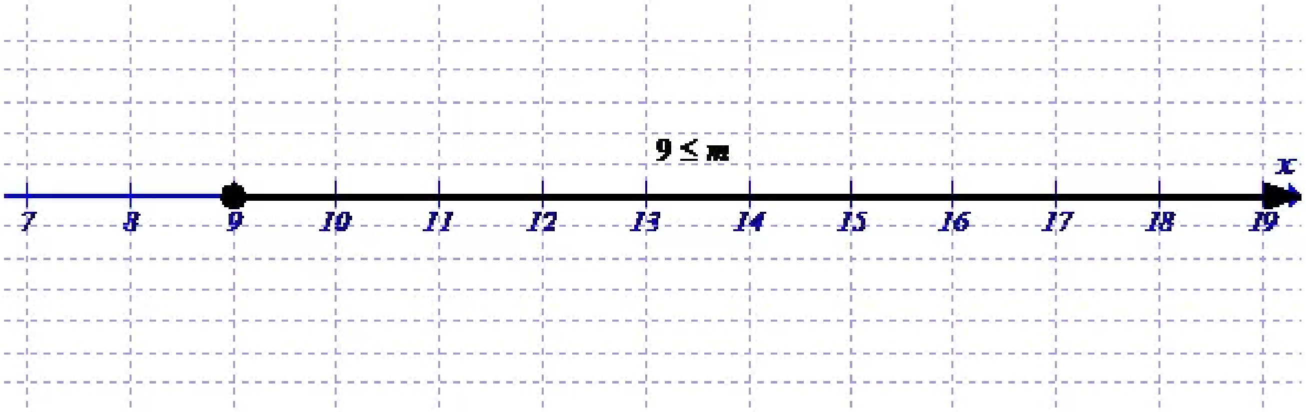
Now check the solution as follows:

Take $m = 15$. Therefore

$8 \stackrel{?}{=} 15 - 1$

$8 \le 14$ True

The graph of the solution can be drawn in the number line as follows:



Answer 58MYS.

Consider the inequality:

$$3 > 10 + k$$

To solve the inequality follows the steps:

$$\begin{aligned} 3 &> 10 + k \\ 3 - 10 &> k \quad \text{Subtract 10 from both sides} \\ -7 &> k \end{aligned}$$

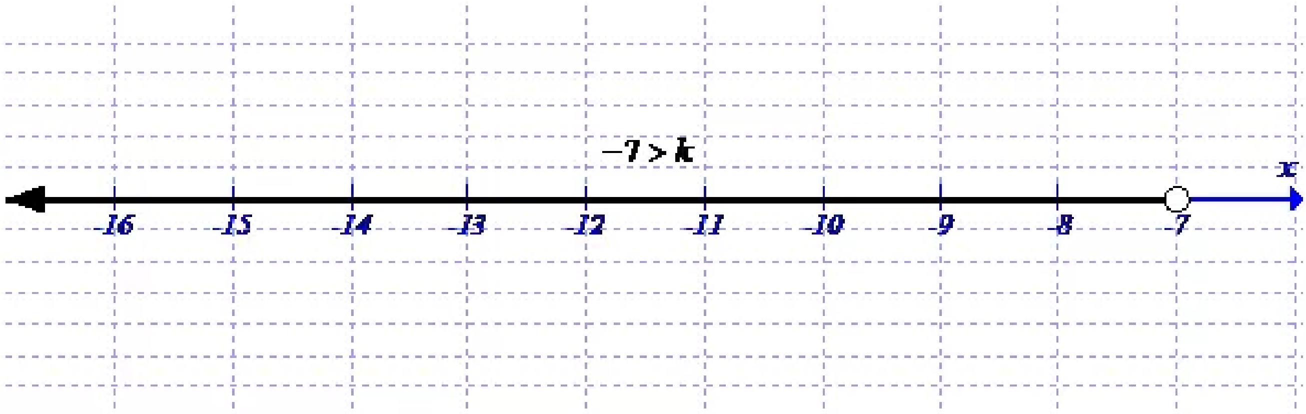
Now check the solution as follows:

Take $k = -10$. Therefore

$3 \stackrel{?}{=} 10 - 10$

$3 > 0$ True

The graph of the solution can be drawn in the number line as follows:



Answer 59MYS.

Consider the inequality:

$$3x \le 2x - 3$$

To solve the inequality follows the steps:

$$3x \le 2x - 3$$

$$3x - 2x \le -3 \qquad \text{Subtract } 2x \text{ from both sides}$$

$$x \le -3$$

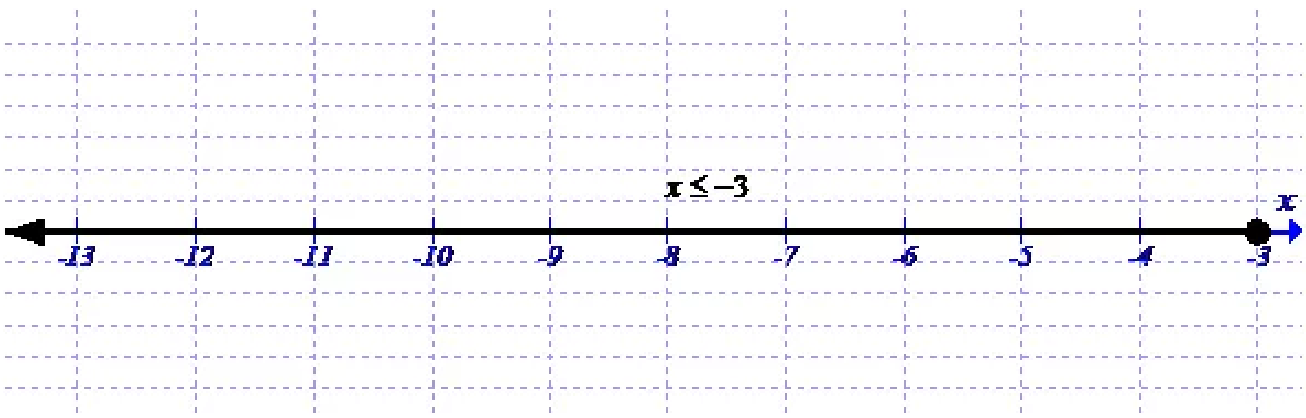
Now check the solution as follows:

Take $x = -5$. Therefore

$$3(-4) \overset{?}{\le} 2(-4) - 3$$

$$-12 \le -11 \qquad \text{True}$$

The graph of the solution can be drawn in the number line as follows:



Answer 60MYS.

Consider the inequality:

$$v-(-4)>6$$

To solve the inequality follows the steps:

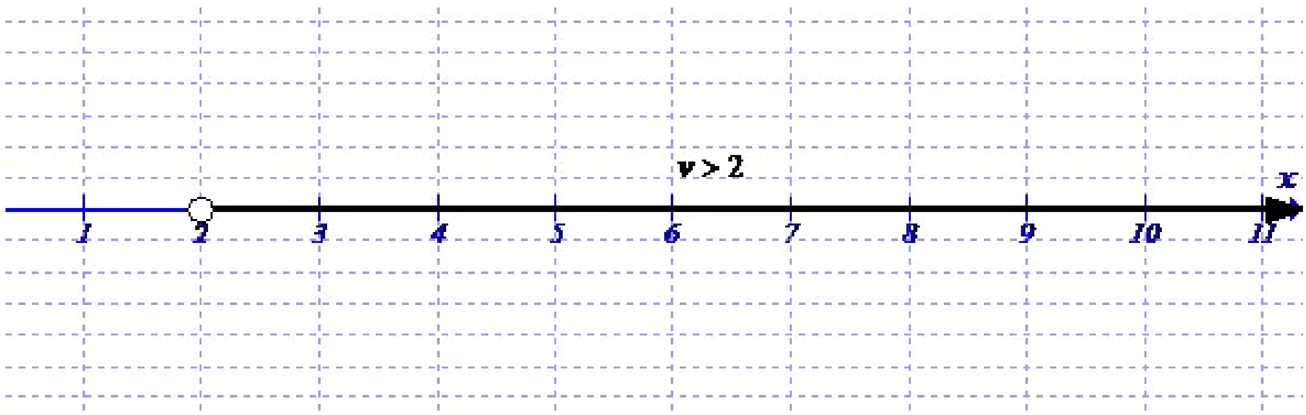
$$v-(-4)>6$$
$$v+4>6$$
$$v>6-4 \quad \text{Subtract 4 from both sides}$$
$$v>2$$

Now check the solution as follows:

Take $v=4$. Therefore

$$4-(-4) \stackrel{?}{=} 6$$
$$8>6 \quad \text{True}$$

The graph of the solution can be drawn in the number line as follows:



Answer 6MYS.

Consider the inequality:

$$r-5.2\geq 3.9$$

To solve the inequality follows the steps:

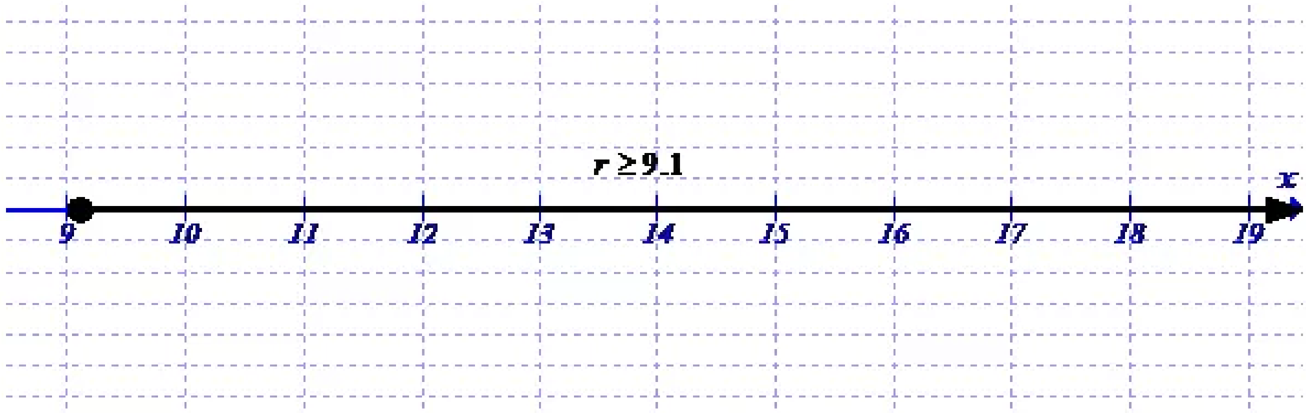
$$r-5.2\geq 3.9$$
$$r\geq 3.9+5.2$$
$$r\geq 9.1 \quad \text{Add 5.2 to both sides}$$

Now check the solution as follows:

Take $r=10$. Therefore

$$10-5.2 \stackrel{?}{=} 3.9$$
$$4.8\geq 3.9 \quad \text{True}$$

The graph of the solution can be drawn in the number line as follows:



Answer 62MYS.

Consider the inequality:

$$s+\frac{1}{6}\le\frac{2}{3}$$

To solve the inequality follows the steps:

$$s+\frac{1}{6}\le\frac{2}{3}$$

$$s\le\frac{2}{3}-\frac{1}{6} \qquad \text{Subtract } \frac{1}{6} \text{ from both sides}$$

$$s\le\frac{4}{6}-\frac{1}{6}$$

$$s\le\frac{3}{6}$$

$$s\le\frac{1}{2}$$

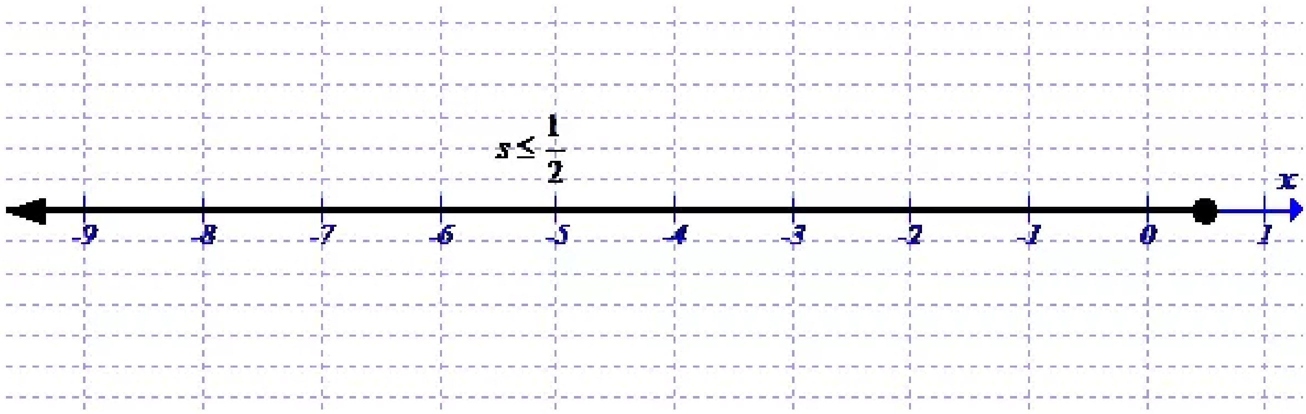
Now check the solution as follows:

Take $s=0$. Therefore

$$\frac{1}{6}\overset{?}{\le}\frac{2}{3}$$

$$\frac{1}{6}\le\frac{2}{3} \qquad \text{True}$$

The graph of the solution can be drawn in the number line as follows:



Answer 63MYS.

Consider the proportion:

$$\frac{x}{4}=\frac{3}{2}$$

To solve for *x* follows the steps:

$$\frac{x}{4}=\frac{3}{2}$$

$$2x=4\times3 \qquad \text{Use cross multiplication}$$

$$2x=12$$

$$x=\frac{12}{2} \qquad \text{Divide both sides by 2}$$

$$=6$$

Thus the solution is: $\boxed{x=6}$.

Answer 64MYS.

Consider the proportion:

$$\frac{20}{x}=\frac{-5}{2}$$

To solve for *x* follows the steps:

$$\frac{20}{x}=\frac{-5}{2}$$

$$20\times2=-5x \qquad \text{Use cross multiplication}$$

$$-5x=40$$

$$x=\frac{-40}{5} \qquad \text{Divide both sides by } (-5)$$

$$=-8$$

Thus the solution is: $\boxed{x=-8}$.

Answer 65MYS.

Consider the proportion:

$$\frac{6}{9}=\frac{8}{x}$$

To solve for *x* follows the steps:

$$\frac{6}{9}=\frac{8}{x}$$

$$6x=9\times 8 \quad \text{Use cross multiplication}$$

$$6x=72$$

$$x=\frac{72}{6} \quad \text{Divide both sides by 6}$$

$$=12$$

Thus the solution is: $\boxed{x=12}$.

Answer 66MYS.

Consider the proportion:

$$\frac{10}{12}=\frac{x}{18}$$

To solve for *x* follows the steps:

$$\frac{10}{12}=\frac{x}{18}$$

$$10\times 18=12x \quad \text{Use cross multiplication}$$

$$12x=180$$

$$x=\frac{180}{12} \quad \text{Divide both sides by 12}$$

$$=15$$

Thus the solution is: $\boxed{x=15}$.

Answer 67MYS.

Consider the proportion:

$$\frac{x+2}{7}=\frac{3}{7}$$

To solve for *x* follows the steps:

$$\begin{aligned}
\frac{x+2}{7}&=\frac{3}{7}\\
\left(\frac{x+2}{7}\right)\times 7&=\left(\frac{3}{7}\right)\times 7 &&\text{Multiply both sides by 7}\\
x+2&=3\\
x&=3-2 &&\text{Subtract 2 from both sides}\\
x&=1
\end{aligned}$$

Thus the solution is: $\boxed{x=1}$.

Answer 68MYS.

Consider the proportion:

$$\frac{2}{3}=\frac{6}{x+4}$$

To solve for *x* follows the steps:

$$\begin{aligned}
\frac{2}{3}&=\frac{6}{x+4}\\
2(x+4)&=3\times 6 &&\text{Use cross multiplication}\\
2x+8&=18\\
2x&=18-8 &&\text{Subtract 8 from both sides}\\
2x&=10\\
x&=\frac{10}{2}\\
&=5
\end{aligned}$$

Thus the solution is: $\boxed{x=5}$.