1-2 Line Segments and Distance

Find the measurement of each segment. Assume that each figure is not drawn to scale.

14. $\overline{PR}$

SOLUTION:

$PS = PR + RS$	Betweenness of points
$PS - RS = PR + RS - RS$	$-RS$ from each side.
$PS - RS = PR$	Simplify.
$5.8 - 3.7 = PR$	Substitution
$2.1 = PR$	Simplify.

So, PR = 2.1 mm.

ANSWER:

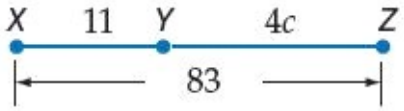
2.1 mm

Find the value of the variable and YZ if Y is between X and Z.

18. $XY = 11$, $YZ = 4c$, $XZ = 83$

SOLUTION:

Here Y is between X and Z.



So, $XZ = XY + YZ$.

$XZ = XY + YZ$	Betweenness of points
$83 = 11 + 4c$	Substitution
$83 - 11 = 11 - 11 + 4c$	-11 from each side.
$72 = 4c$	Simplify
$\frac{72}{4} = \frac{4c}{4}$	$\div$ each side by 4.
$18 = c$	Simplify.

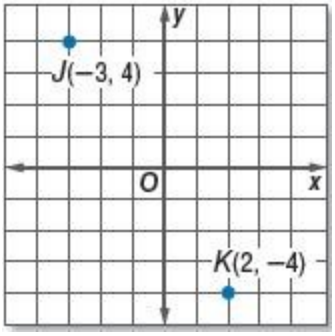
So, $YZ = 4c = 4(18) = 72$.

ANSWER:

c = 18; YZ = 72

Find the distance between each pair of points.

30.



SOLUTION:

Use the Distance Formula.

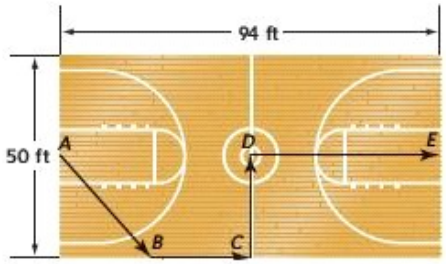
$JK = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	Distance Formula
$= \sqrt{(2 - (-3))^2 + (-4 - 4)^2}$	Substitution.
$= \sqrt{5^2 + (-8)^2}$	Subtraction.
$= \sqrt{25 + 64}$	Square terms.
$= \sqrt{89}$	Addition.
≈ 9.4	

The distance between J and K is $\sqrt{89}$ or about 9.4 units.

ANSWER:

$\sqrt{89}$ or about 9.4 units

53. **MULTI-STEP** Coach Willis designs a play that requires the ball to be passed from point *A* to point *E* as shown below. The arrows represent quick passes to different members of his team. Randi can throw the ball from under the basket to midcourt, Jen and Mandy can throw the ball half the width of the court, Makayla can throw the ball to the free throw line from under the basket, and Kim can throw the ball farther than Jen.



a. In which position should each girl be?
b. Describe your solution process.
c. What assumptions did you make?

SOLUTION:

a. A: Kim, B: Jen or Mandy, C: Jen or Mandy, D: Randi, E: Makayla
b. I know that Makayla can throw the shortest distance of all 5 team members and that Randi can throw the farthest. So I chose to place these players at points *E* and *D*, respectively. Jen and Mandy can each throw 25 feet (half the width of the court), so I placed them at either point *B* or point *C*. Kim will be at point *A*, and the team will be able to complete the play provided Kim can throw at least 33.3 feet.
c. I assumed that the player at point *B* would be 25 feet from point *C*.

ANSWER:

a. A: Kim, B: Jen or Mandy, C: Jen or Mandy, D: Randi, E: Makayla
b. I know that Makayla can throw the shortest distance of all 5 team members and that Randi can throw the farthest. So I chose to place these players at points *E* and *D*, respectively. Jen and Mandy can each throw 25 feet (half the width of the court), so I placed them at either point *B* or point *C*. Kim will be at point *A*, and the team will be able to complete the play provided Kim can throw at least 33.3 feet.
c. I assumed that the player at point *B* would be 25 feet from point *C*.