Name: Key

EXPLORING DISTANCES AT THE PARK

Answer each question below. Locate and label each item on the coordinate plane. Show your work in the spaces provided.

1. Holly wants to create a map of her local park on the grid. Each unit is equal to 1 meter. Plot these locations:
   Oak Tree (8, 10) Slide (-4, -6) Bike Rack (5, -6)

2. How far is the slide from the bike rack?

$\sqrt{(5-^{-}4)^2+(-6-^{-}6)^2} = \sqrt{81} =$ 9 meters

3. A duck is standing at the midpoint between the slide and bike rack. Where is the duck?

$\left(\frac{-4+5}{2}, \frac{-6+^{-}6}{2}\right) = \left(\frac{1}{2}, \frac{-12}{2}\right) =$ Duck $\left(\frac{1}{2}, -6\right)$

4. A duckling is also between the slide and bike rack, but not at the midpoint. The duckling's distance from the slide and distance from the bike rack can be represented by the ratio 7:2. Where is the duckling?

$\frac{7}{9}$ (-4, -6) (5, -6)
$x_1\ y_1$ $x_2\ y_2$

$-4+\frac{7}{9}(5-^{-}4)$

$-6+\frac{7}{9}(-6-^{-}6)$

Duckling (3, -6)

5. How far is the oak tree from the slide?

$\sqrt{(-4-8)^2+(-6-10)^2} = \sqrt{144+256} =$ 20 meters

6. If Holly stands at the midpoint between the oak tree and slide, what is her location?

$\left(\frac{8+^{-}4}{2}, \frac{10+^{-}6}{2}\right) =$ (2, 2)

7. The water fountain is located between the oak tree and slide, but not at the midpoint. The ratio of the water fountain's distance from the oak tree to the distance from the slide is 1:3. Where is it located on the coordinate plane?

$8+\frac{1}{4}(-4-8)$ $10+\frac{1}{4}(-6-10)$

Fountain (5, 6)

8. The picnic table is located 8 meters from the slide and 6 meters from Holly. The duck and duckling are not near the picnic table. Where is the picnic table?

Picnic Table (-4, 2)

9. A goose is standing between the picnic table and oak tree. Its location partitions the distance between the picnic table and oak tree in the ratio 3:1. Where is the goose?

(-4, 2) (8, 10)
$x_1\ y_1$ $x_2\ y_2$

$-4+\frac{3}{4}(8-^{-}4) = 5$

$2+\frac{3}{4}(10-2) = 8$

goose (5, 8)

10. What is Holly's distance from the goose?

(2, 2) (5, 8) $d = \sqrt{(5-2)^2+(8-2)^2} = \sqrt{9+36}$

$= \sqrt{45} = 3\sqrt{5} \approx 6.7$

11. Joseph is exactly 13 meters from Holly, and he is located in the 4th quadrant on the grid. Where is Joseph? (2, -11)

Find Holly then count down 13 spaces.

12. If Holly and Joseph race to the slide, who is likely to win if they can run the same speed? (2, 2) (-4, -6) (2, -11) (-4, -6)

$d = \sqrt{(-4-2)^2+(-6-2)^2} = \sqrt{36+64} = \sqrt{100} = 10$ ← Holly

$d = \sqrt{(-4-2)^2+(-6-^{-}11)^2} = \sqrt{36+25} = \sqrt{61} = 7.8$ ← Joseph will win

13. The goose is standing at the midpoint between the oak tree and magnolia tree. Where is the magnolia tree?

Midpt (5, 8)
Endpoint (8, 10)

E (8, 10) > -2
M -3 (5, 8) > -2
E -3 (2, 6)

(2, 6)

14. The duck is standing at the midpoint between Joseph and tire swing. Where is the tire swing?

Midpt $\left(\frac{1}{2}, -6\right)$
Endpt (2, -11)

E 1.5 (2, -11) > +5
M $\left(\frac{1}{2}, -6\right)$
-1.5 <
E (-1, -1) > +5

Swing (-1, -1)

ey

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