



Building Concepts: Visualizing Systems of Linear

Equations

Student Activity

Name _____

Class _____

In these activities, you will reason about solutions to systems of equations while modeling the systems on mobiles.



Activity 1 [Page 1.3]

1. Add a circle to the left arm of the mobile.
 - a. Set the total value to 36, and determine values for the circle, triangle, and square where at least one of the values is negative.

 - b. Write an equation representing the relationships between the arms of the mobile. Be sure to define the variables in your equation.

 - c. Is there a unique (only one) value for each of the shapes represented by your equation in b) that makes the statement true? Why or why not? Give an example to support your reasoning.



Activity 2 [Page 2.2]

1. Use **menu**> **Mobiles** to select the indicated mobile. Write an equation that represents the relationship among the shapes and find the value of the missing shapes.
 - a. **Reset**. Select **Mobile 2**. Let circle = -4 and square = 16 . Find the value of a triangle.



Building Concepts: Visualizing Systems of Linear

Equations

Student Activity

Name _____

Class _____

- b. **Reset.** Select **Mobile 3**. Let $T = -12$ and $S = 5$.
- c. **Reset.** Select **Mobile 3**. Replace one triangle on the right arm of Mobile 3 with a circle. Let $C = -4$ and $T = 1$.



Activity 3 [Page 3.2]

1. Determine values for the shapes on the mobile that will balance the mobile and reach the given total value.
 - a. **Reset.** Select **menu > Mobiles > mobile 3**. The total value is 48.
 - b. Consider the mobile in the previous question. Does it make any difference which of the arms have which of the expressions? Why or why not?



Building Concepts: Visualizing Systems of Linear

Equations

Student Activity

Name _____

Class _____



Activity 4 [Page 4.3]

1. Let P = the value of the pentagon, S the value of the square, C the value of the circle, and T the value of the triangle. Create the mobiles $2T + P = C + 3S$ and $S = 2T$.
 - a. Enter the value of the pentagon as -1 and of the circle as -5 . Submit and find the value of the square and the triangle. Explain your thinking, then check to see if you are correct.
 - b. Suppose the pentagon has value $-\frac{1}{2}$, and the circle value has value $-\frac{5}{2}$. Find the values of the square and triangle. Explain your reasoning.
 - c. Create $2T + P = C + S$ and $S = 2T$. If $T = -2$, find the values of C , P , and S that will balance the mobiles.
 - d. Change one of the two equations in c) so that no values for C or S will make both of the mobiles balance.