Flashcards: Dilations

Directions: Answer the following questions.

1. Determine if each image below are an enlargement or a reduction.
a. large arrow changing to small arrow
b. small moon changing to large moon
c. small plus sign changing to large plus sign
d. large heart changing to small heart

2. Line segment AB is dilated to produce line segment A'B'. Point A is located at (1, -3) and is dilated to Point A' (3, -9). Point B is located at point (2, 4) and is dilated to point B' (6, 12). What is the scale factor?

3. Triangle PQR located at P (8, -3), Q (6, 2), and R (-5, 4) is dilated with a scale factor of one-half. Give the coordinates where is the dilation located.

4. Point C is located at (4, 2) and Point D is located at (1, -2).
a. Determine the length of the line segment CD.

The line segment is dilated by a scale factor of three-fourths.
b. Find the new coordinates of line segment C'D'.
c. How does the length of CD compare with the length of C'D'?

Answers:

1. a. Reduction – since the second image is smaller than the first
b. Enlargement – since the second image is larger than the first
c. Enlargement – since the second image is larger than the first
d. Reduction – since the second image is smaller than the first

2. A' = A·f, where f is the scale factor.
x-coordinate:
3 = 1·f
f = 3
y-coordinate:
-9 = -3·f
f = 3

B' = B·f, where f is the scale factor.
x-coordinate:
6 = 2·f
f = 3
y-coordinate:
12 = 4·f
f = 3

Therefore, the scale factor is 3. This is an enlargement because the absolute value of the scale factor (|3| = 3) is greater than 1.)

3. Since Triangle XYZ has a scale factor of one-half we know that the dilated triangle will be smaller. This is a reduction because the scale factor is between 0 and 1.

P (8, -3):
x’ = one-half times (8) = 4
y’ = one-half times (-3) = negative three-halves
P’ (4, negative three-halves)

Q (6, 2):
x’ = one-half times (6) = 3
y’ = one-half times (2) = 1
Q’ (3, 1)

R (-5, 4):
x’ = one-half times (-5) = negative five-halves
y’ = one-half times (4) = 2
R’ (negative five-halves, 2)

Triangle P’Q’R’ is located at: P’ (4, negative three-halves); Q’ (3, 1); R’ (negative five-halves, 2)

4. a. CD equals square root of the quantity x 2 minus x 1 squared plus the quantity y 2 minus y 1 squared equals square root of the quantity 1 minus 4 squared plus negative 2 minus 2 squared equals square root of negative 3 squared plus negative 4 squared equals square root of 9 plus 16 equals the square root of 25 equals 5.
The length of line segment CD is 5 units.

b. Coordinates of C’ and D’:
C(4, 2):
x’ = three-fourths times (4) = 3
y’ = three-fourths times (2) = six-fourths =three-halves
C’ (3, three-halves)
D(-1, -2):
x’ = three-fourths times (1) = three-fourths
y’ = three-fourths times (-2) = negative six-fourths =negative three-havles
D’ (three-fourths, negative three-halves)

The coordinates of line segment C’D’ are: C’ (3, three-halves) and D’ (three-fourths, negative three-halves).

c. C’D’ equals square root of the quantity x 2 minus x 1 squared plus the quantity y 2 minus y 1 squared equals square root of the quantity three-fourths minus 3 squared plus negative three halves minus three-halves squared equals square root of negative nine-fourths squared plus negative six-hales squared equals square root of 81 sixteenths plus 36 fourths equals the square root of 225 sixteenths equals fifteen-fourths.

C’D’ = three-fourths time CD