

DO NOW
 Given the triangle ABC, A(-3, 2), B(-5, 4), and C(-4, 6),
 Graph and state the coordinates of triangle A'B'C', the
 image of triangle ABC, after a reflection over the x-axis.

$A(-3, 2) \rightarrow A'(-3, -2)$
 $B(-5, 4) \rightarrow B'(-5, -4)$
 $C(-4, 6) \rightarrow C'(-4, -6)$

Mar 3-1:45 PM

A **dilation** stretches or shrinks the original figure
 -produces an image that is the same shape as the
 original, but is a *different size*

A dilation with scale factor k , is written as: D_k
 > The **scale factor**, k , is the number you
 multiply by to get your image points

- If the **scale factor**, k , is **greater than 1**, the
 image is an **enlargement** (a stretch).
- If the **scale factor** is **between 0 and 1**, the
 image is a **reduction** (a shrink).

Mar 3-1:47 PM

Example 1: Draw the dilation image of triangle ABC,
 with the vertices A(-2,-2), B(1,-1), C(0,2), with the
 center of dilation at the origin and a scale factor of 2.

$A(-2, -2) \xrightarrow{D_2} A'(-4, -4)$
 $B(1, -1) \rightarrow B'(2, -2)$
 $C(0, 2) \rightarrow C'(0, 4)$

Mar 3-1:49 PM

Example 2: Draw the dilation image of rectangle EFGH,
 with vertices E(-4,-4) F(-4,8) G(4,8) H(4,-4), with the
 center of dilation at the origin and a scale factor of 1/2.

$E(-4, -4) \rightarrow E'(-2, -2)$
 $F(-4, 8) \rightarrow F'(-2, 4)$
 $G(4, 8) \rightarrow G'(2, 4)$
 $H(4, -4) \rightarrow H'(2, -2)$

Mar 3-1:53 PM

Example 3: Plot and state the coordinates of the image of
 triangle ABC, A(0,3), B(-3,-3), C(3,-6), under $D_{1/3}$

$A(0, 3) \xrightarrow{D_{1/3}} A'(0, 1)$
 $B(-3, -3) \rightarrow B'(-1, -1)$
 $C(3, -6) \rightarrow C'(1, -2)$

Mar 3-1:56 PM

Example 4: Under a dilation, triangle A(0,0), B(0,4),
 C(6,0) becomes triangle A'(0,0), B'(0,10), C'(15,0).
 What is the scale factor for this dilation?

$D_{2.5}$
 Scale factor: 2.5

Mar 3-1:55 PM

Example 5: What will be the coordinates of the image of point triangle ABC , $A(1,1)$, $B(2,3)$, $C(4,1)$ after the transformation D_3 ?

Mar 3-1:55 PM

Example 6: Under a dilation with respect to the origin, the image of $A(2, -3)$ is $A'(8, -12)$. Under the same dilation, what are the coordinates of B' , the image of $B(-1,3)$?

May 8-8:17 AM

May 13-9:07 AM

DO NOW

1) What is the range of the data shown in the box and whisker plot?
 $12 - 1 = 11$

2) What percent of the data falls below 10?
 75%

May 21-7:19 AM

Exercise #1: The two data sets below each have equal means but differ in the variation within the data set. Use your calculator to determine the Interquartile Range (IQR) of each data set. The IQR is defined as the difference between the third quartile value and the first quartile value.

Data Set #1: 3, 3, 4, 4, 5, 5, 6, 6, 7, 8, 8, 9, 9, 10, 10, 11, 11
 $Q_1 = 4.5$ $IQR \rightarrow Q_3 - Q_1$
 $Q_3 = 9.5$ $9.5 - 4.5 = 5$

Data Set #2: 5, 5, 6, 6, 7, 7, 8, 8, 9, 9
 $Q_1 = 6$ $IQR = 8 - 6$
 $Q_3 = 8$

May 8-12:39 PM

Exercise #2: Using the same data sets above, use your calculator to produce the standard deviation (shown as σ_x on the calculator) of the two data sets. Round your answers to the nearest tenth.

Data Set #1:
 $\sigma_x = 2.7$

Data Set #2:
 $\sigma_x = 1.4$

Standard Deviation
 The standard deviation of a data set tells us, on average, how far a data point is away from the mean of the data set. The larger the standard deviation, the greater the variation within the data set.

May 8-12:41 PM

Exercise #3: A farm is studying the weight of baby chickens (chicks) after 1 week of growth. They find the weight, in ounces, of 20 chicks. The weights are shown below. Find the mean, the interquartile range and the standard deviation for this data set. Round any non-integer values to the nearest tenth. Include appropriate units in your answers. Give an interpretation of the standard deviation.

2, 1, 3, 4, 2, 2, 3, 1, 5, 3, 4, 4, 5, 6, 3, 8, 5, 4, 6, 3

\bar{x}
mean
3.7

interquartile range (IQR)
 $Q_1 = 2.5$
 $Q_3 = 5$
 $IQR = 2.5$

σ_x
standard deviation
1.7

May 8-12:42 PM

Exercise #4: A marketing company is trying to determine how much diversity there is in the age of people who drink different soft drinks. They take a sample of people and ask them which soda they prefer. For the two sodas, the age of those people who preferred them is given below.

Soda A: 18, 16, 22, 16, 28, 18, 21, 38, 22, 29, 25, 44, 36, 27, 40
 $\bar{x} = 26.7$
 $\sigma_x = 8.8$

Soda B: 25, 22, 18, 30, 27, 19, 22, 28, 25, 19, 23, 29, 26, 18, 20
 $\bar{x} = 23.4$
 $\sigma_x = 3.9$

(a) Explain why standard deviation is a better measure of the diversity in age than the mean.

(b) Which soda appears to have a greater diversity in the age of people who prefer it? How did you decide on this?

(c) Use your calculator to determine the **sample standard deviation**, normally given as s_x , for both data sets. Round your answers to the nearest tenth. Did this answer reinforce your pick from (b)? How?

May 8-12:44 PM

Exercise #5: Which of the following data sets would have a standard deviation (population) closest to zero? Do this without your calculator. Explain how you arrived at your answer.

(1) $\{-5, -2, -1, 0, 1, 2, 5\}$ (3) $\{11, 11, 12, 13, 13\}$
 (2) $\{5, 8, 10, 16, 20\}$ (4) $\{3, 7, 11, 11, 11, 18\}$

May 8-12:46 PM