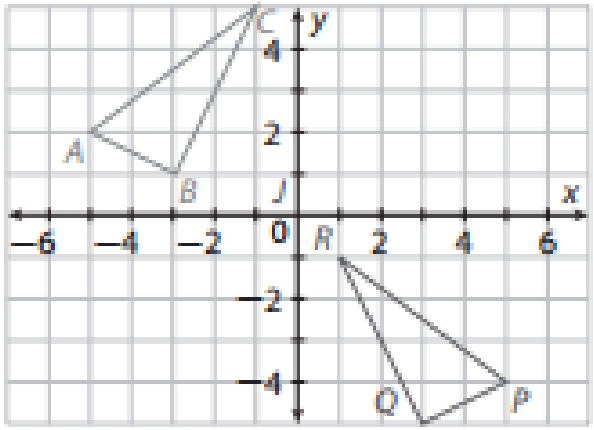
Check Homework

5. Map $\triangle ABC$ to $\triangle PQR$.

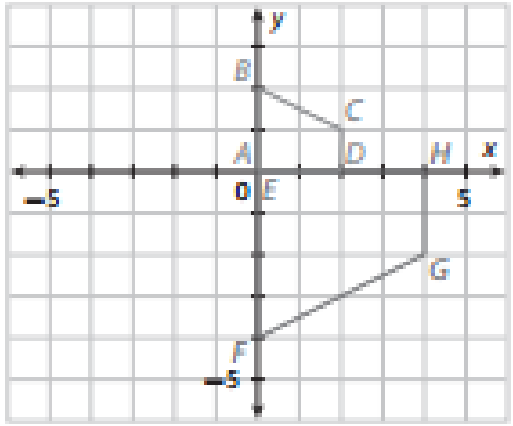


You can map $\triangle ABC$ to $\triangle PQR$ by a reflection followed by a translation.

Reflection: $(x, y) \rightarrow (-x, y)$

Translation: $(x, y) \rightarrow (x, y-6)$

6. Map $ABCD$ to $EFGH$.

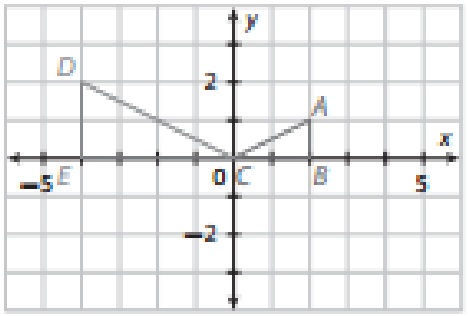


You can map $ABCD$ to $EFGH$ by a reflection followed by a dilation.

Reflection: $(x, y) \rightarrow (x, -y)$

Dilation: $(x, y) \rightarrow (2x, 2y)$

7. Map $\triangle CED$ to $\triangle CBA$.

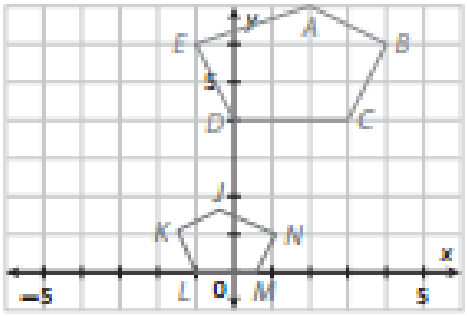


You can map $\triangle CED$ to $\triangle CBA$ by a reflection followed by a dilation.

Reflection: $(x, y) \rightarrow (-x, y)$

Dilation: $(x, y) \rightarrow \left(\frac{1}{2}x, \frac{1}{2}y\right)$

8. Map $ABCDE$ to $JKLMN$.



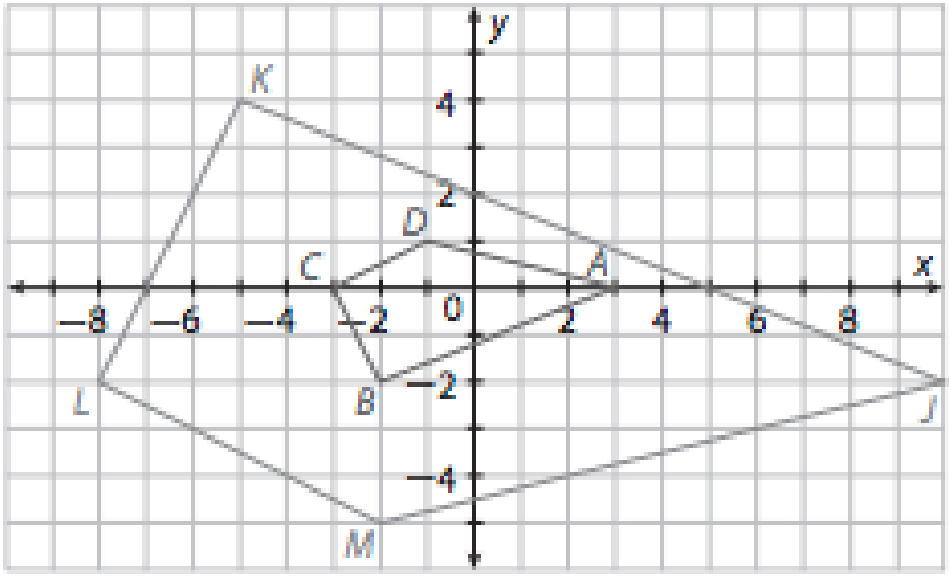
You can map $ABCDE$ to $JKLMN$ by a reflection followed by a dilation centered at the origin followed by a translation.

Reflection: $(x, y) \rightarrow (-x, y)$

Dilation: $(x, y) \rightarrow \left(\frac{1}{2}x, \frac{1}{2}y\right)$

Translation: $(x, y) \rightarrow \left(x + \frac{1}{2}, y - 2\right)$

9. Map *ABCD* to *JKLM*.



You can map *ABCD* to *JKLM* by a reflection followed by a dilation centered at the origin followed by a translation.

Reflection: $(x, y) \rightarrow (x, -y)$

Dilation: $(x, y) \rightarrow (3x, 3y)$

Translation: $(x, y) \rightarrow (x + 1, y - 2)$

18. Which of the following is a dilation?

A. $(x, y) \rightarrow (x, 3y)$

B. $(x, y) \rightarrow (3x, -y)$

C. $(x, y) \rightarrow (3x, 3y)$

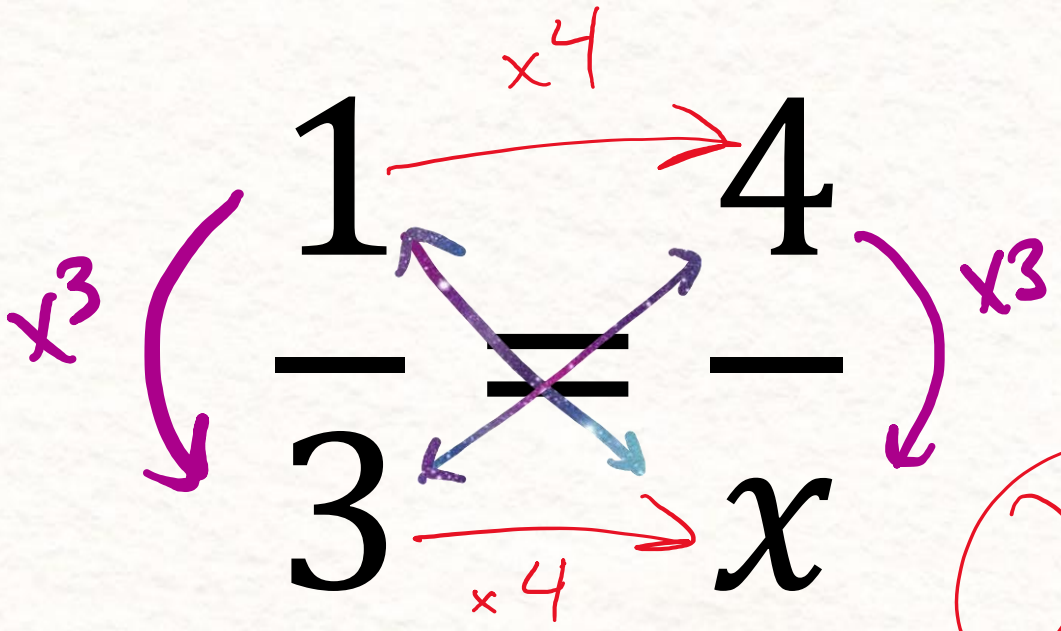
D. $(x, y) \rightarrow (x, y - 3)$

E. $(x, y) \rightarrow (x - 3, y - 3)$

Hand Back Quizzes

Quiz Tuesday

- Dilations 16.1
- Sequence of Transformations 16.2
- Proportions (7^{th} grade)
- Parts of Similar Figures 16.3
- Similarity Shortcuts 16.4

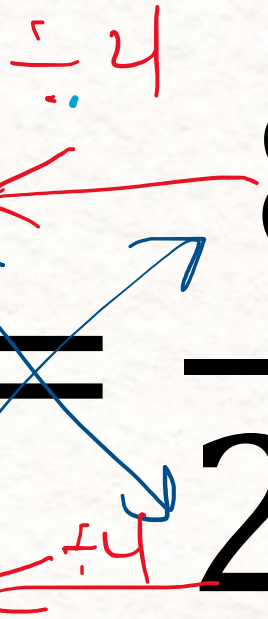


$x = 12$

$1x = 12$

$x = 12$

$$\frac{2}{x} = \frac{8}{20}$$



$40 = 8x$

$5 = x$

$$\frac{35}{-40} = \frac{7}{x}$$

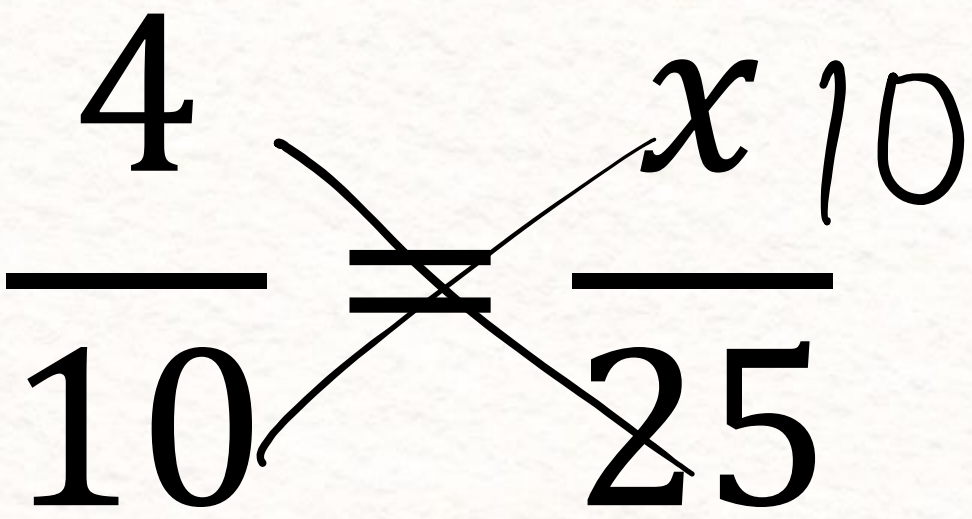
$\div 5$ $\div 5$

$x = -8$

$$\frac{x}{11} = \frac{100}{20}$$

$\times 5$ $\times 5$

$x = 55$

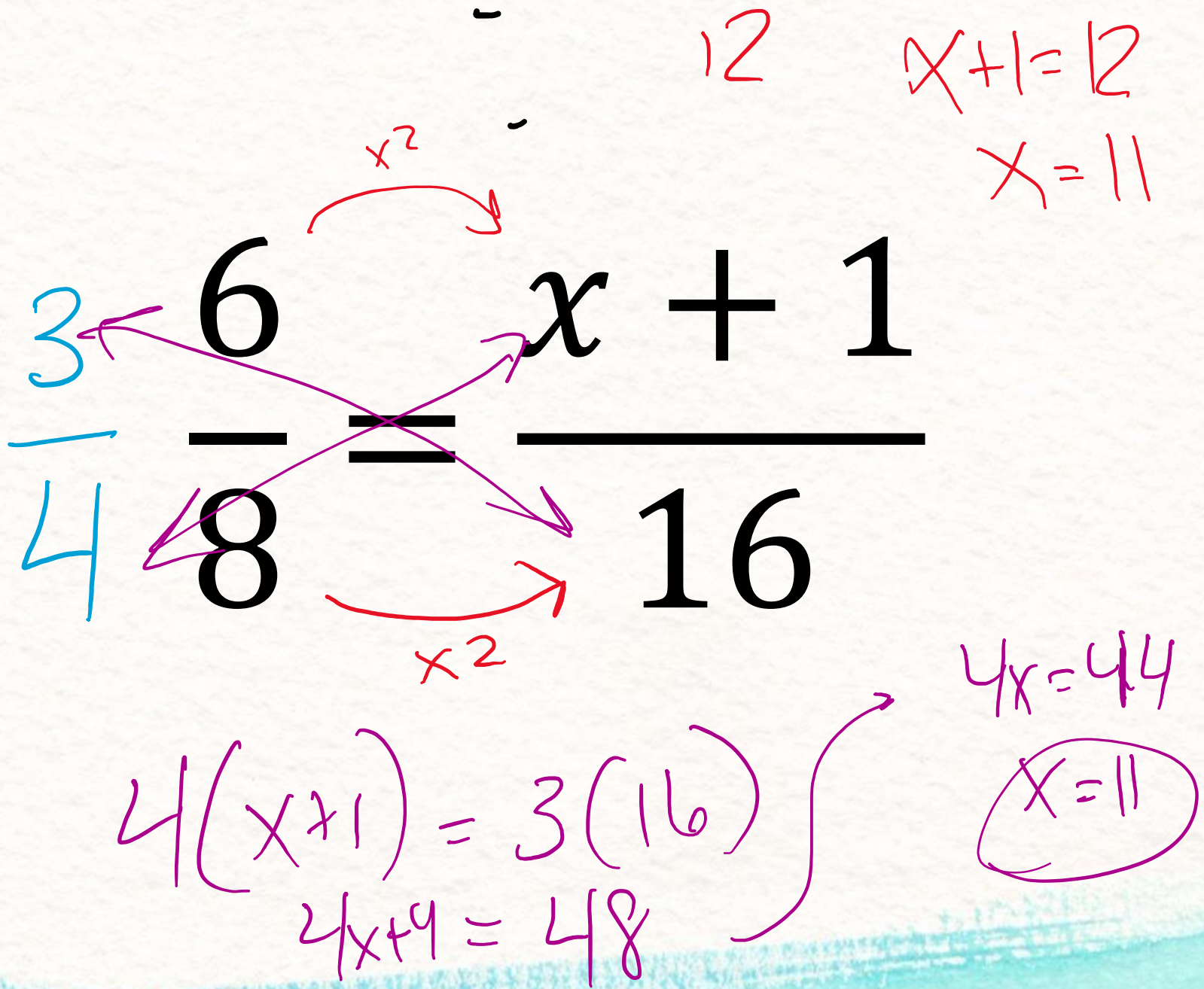


$100 = 10x$

$10 = x$

$$\frac{x}{12} = \frac{15}{20}$$

$$\frac{30}{45} = \frac{22}{x}$$


12
x+1=12
x=11
x²
6
x + 1
3
4
8
16
x²
4(x+1) = 3(16)
4x+4 = 48
4x=44
x=11

$$\frac{10}{x-2} = \frac{30}{18}$$

5

3

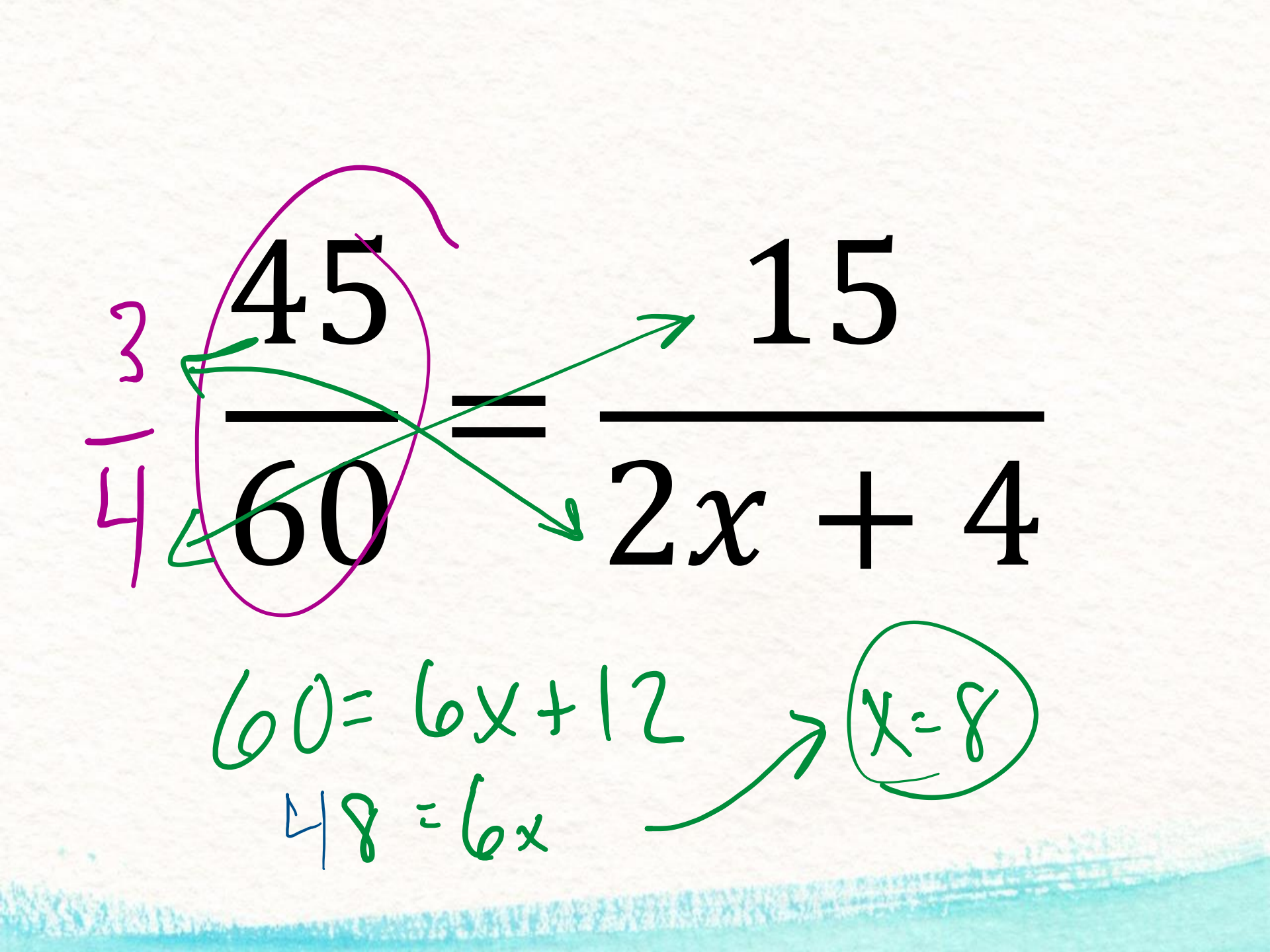
$5(x-2) = 30$

$5x - 10 = 30$

$5x = 40$

$x = 8$

$$\frac{4x}{24} = \frac{5}{15}$$


45
60
15
2x + 4
3
4
60 = 6x + 12
48 = 6x
x = 8

$$\frac{24}{36} = \frac{20 - x}{27}$$

$$\frac{x+2}{12} = \frac{x-1}{8}$$

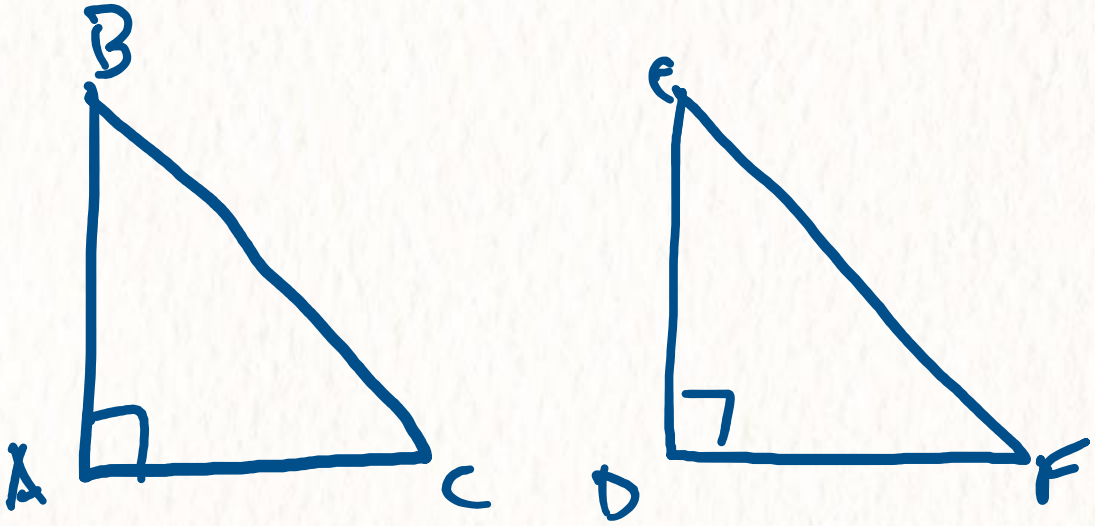
$8(x+2) = 12(x-1)$

$8x+16 = 12x-12$

$28 = 4x$

$x = 7$

Congruent Figures



~~$\triangle ABC \cong \triangle FED$~~

$\triangle ABC \cong \triangle DEF$

Congruence statement

- Objective:
- Explore and understand similar polygons

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

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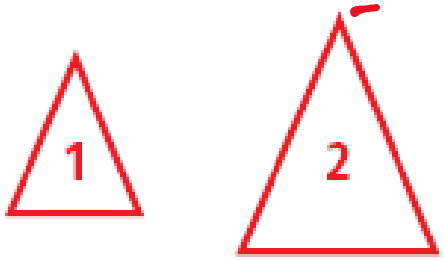
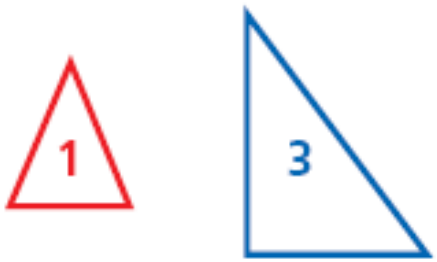
≅ Congruent ~ Similar

Figures that are **similar** (~) have the same shape but not necessarily the same size.



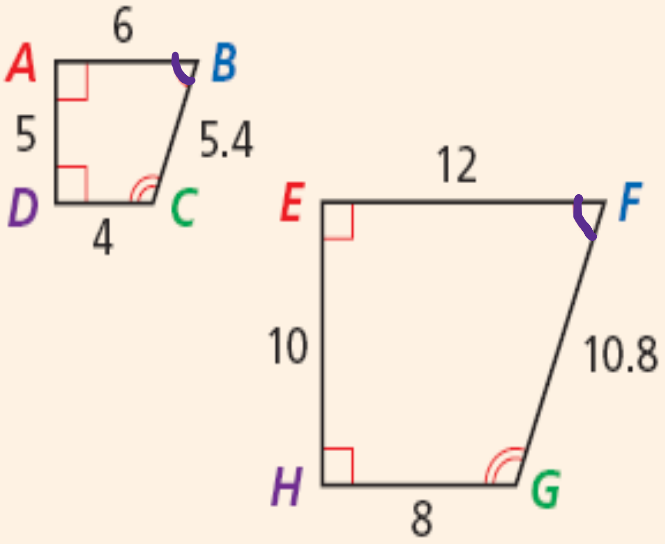
△1 is similar to △2 (△1 ~ △2).



△1 is not similar to △3 (△1 ≁ △3).

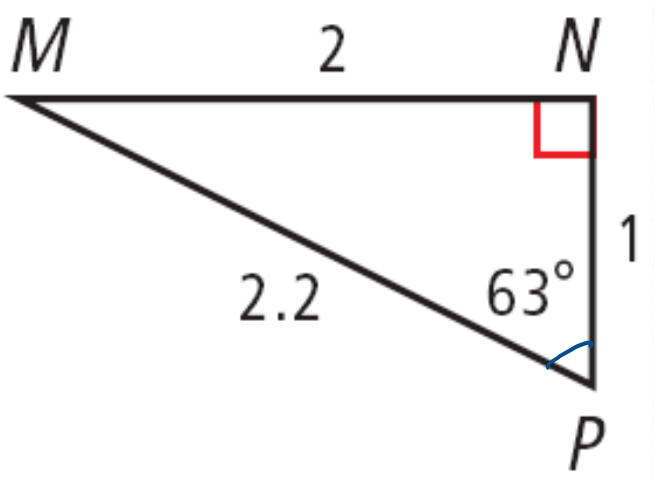
Oh look- a fancy box!

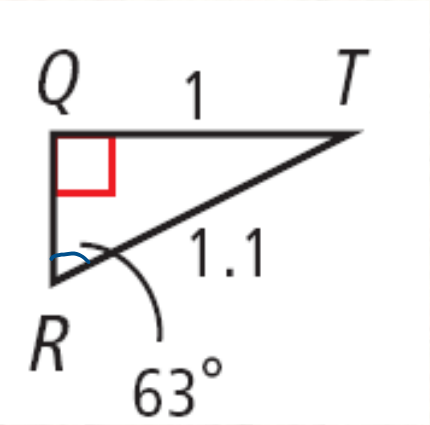
Similar Polygons

DEFINITION	DIAGRAM	STATEMENTS
Two polygons are **similar polygons** if and only if their corresponding angles are congruent and their corresponding side lengths are proportional.	 $ABCD \sim EFGH$	$\angle A \cong \angle E$ $\angle B \cong \angle F$ $\angle C \cong \angle G$ $\angle D \cong \angle H$ $\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{DA}{HE} = \frac{1}{2}$ $\frac{EF}{AB} = \frac{FG}{BC} = \frac{GH}{CD} = \frac{HE}{DA} = \frac{2}{1}$

Writing Math

Writing a similarity statement is like writing a congruence statement—be sure to list corresponding vertices in the same order.





$\triangle MNP \sim \triangle TQR$

$$\frac{MN}{TQ} = \frac{NP}{QR} = \frac{PM}{RT}$$

pg. 853 (A, B)

Example 1 **Identify properties of similar figures.**

(A) Figure *EFGH* maps to figure *RSTU* by a similarity transformation. Write a proportion that contains *EF* and *RU*. List any angles that must be congruent to $\angle G$ or congruent to $\angle U$.

$\frac{EF}{RS} = \frac{EH}{RU}$ $\angle T$ is congruent to $\angle G$, and $\angle H$ is congruent to $\angle U$.

(B) Figure *JKLMN* maps to figure *TUVWX* by a similarity transformation. Write a proportion that contains *TX* and *LM*. List any angles that must be congruent to $\angle V$ or congruent to $\angle K$.

$\frac{JN}{TX} = \frac{LM}{VW}$ $\angle$ L is congruent to $\angle V$, and $\angle$ U is congruent to $\angle K$.

pg. 854 (5, 6)

Your Turn

5. Triangles $\triangle PQR$ and $\triangle LMN$ are similar. If $QR = 6$ and $MN = 9$, what similarity transformation (in coordinate notation) maps $\triangle PQR$ to $\triangle LMN$?

The ratio $\frac{MN}{QR} = 1.5$, therefore the similarity transformation is $(x, y) \rightarrow (1.5x, 1.5y)$.

6. **Error Analysis** Triangles $\triangle DEF$ and $\triangle UVW$ are similar. $\frac{DE}{UV} = \frac{VW}{EF}$ Is the statement true?

No. The proportion must compare corresponding sides. One possibility is $\frac{DE}{UV} = \frac{EF}{VW}$.

pg. 854 B

B

Find the value of x.

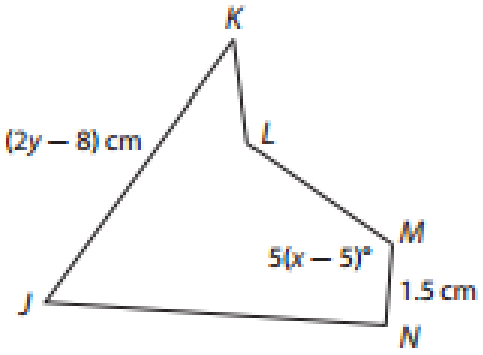
$m\angle LMN = m\angle XYZ$

$5(x-5) = 4x$

$5x - 25 = 4x$

$x = 25$

Find the value of y.



$\frac{JK}{VW} = \frac{MN}{YZ}$

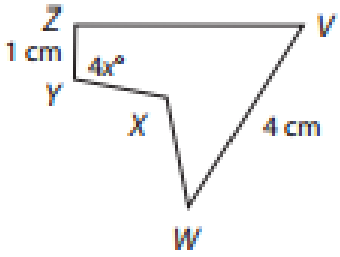
$\frac{2x-8}{4} = \frac{1.5}{1}$

$2x - 8 = 1.5(4)$

$2x - 8 = 6$

$2x = 14$

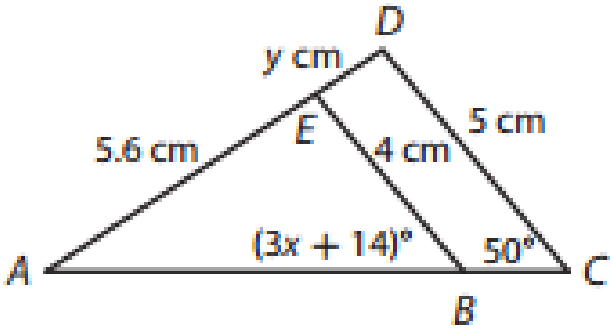
$x = 7$



pg. 855 (8, 9)

Your Turn

Use the diagram, in which $\triangle ABE \sim \triangle ACD$.



8. Find the value of x.

$m\angle C = m\angle ABE$

$50 = 3x + 14$

$36 = 3x$

$12 = x$

9. Find the value of y.

$$\frac{AD}{AE} = \frac{CD}{BE}$$

$$\frac{5.6 + y}{5.6} = \frac{5}{4}$$

$$5.6 + y = \frac{5}{4} \cdot 5.6$$

$$y = 1.4$$

Homework

- pg. 857 (14-17 write a system, 20, 23, 26)