Study Guide for Level 7 Test

All the answers are in your heart. Wait, thats wrong - I mean notes. The answers are in your notes.

Easy

The equation of a line is $3y + 2x = 12$. What is the slope of the line perpendicular to the given line?

1) $\frac{2}{3}$
2) $\frac{3}{2}$
3) $-\frac{2}{3}$
4) $-\frac{3}{2}$

The lines whose equations are $2x + 3y = 4$ and $y = mx + 6$ will be perpendicular when m is

1) $-\frac{3}{2}$
2) $-\frac{2}{3}$
3) $\frac{3}{2}$
4) $\frac{2}{3}$

Medium

Which equation represents a line that is perpendicular to the line represented by $2x - y = 7$?

1) $y = -\frac{1}{2}x + 6$
2) $y = \frac{1}{2}x + 6$
3) $y = -2x + 6$
4) $y = 2x + 6$

Determine if the two lines $2x - 9y = -18$ and $y = \frac{2}{9}x - 3$ are *parallel*, *perpendicular*, or *neither*.

Hard

Which equation represents a line that is parallel to the line whose equation is $2x + 3y = 12$?

1) $6y - 4x = 2$
2) $6y + 4x = 2$
3) $4x - 6y = 2$
4) $6x + 4y = -2$

The equation of a line is $y = \frac{2}{3}x + 5$. What is an equation of the line that is perpendicular to the given line and that passes through the point (-2, 3)?

$y = mx + b$

$m = -\frac{3}{2}$ $\quad 3 = \left(-\frac{3}{2}\right)(-2) + b$

$x = -2$ $\quad 3 = 3 + b$

$y = 3$ $\quad 0 = b$

$y = -\frac{3}{2}x$

Mastery Level

Write the standard form of the equation of the line passing through the point (1, 5) and perpendicular to the line $4x - 7y = -28$.

[A] $7x + 4y = 27$ [B] $-7x - 4y = 27$

[C] $4x + 7y = 39$ [D] $4x - 7y = -39$

Give the slope-intercept form of the equation of the line that is parallel to $8x + 5y = -7$ and contains (5, 3).

$y = -\frac{8}{5}x - \frac{7}{5}$

$y = mx + b$

$m = -\frac{8}{5}$ $\quad 3 = \left(-\frac{8}{5}\right)(5) + b$

$x = 5$

$y = 3$ $\quad 3 = -8 + b$

$11 = b$

$y = -\frac{8}{5}x + 11$

The line 3x - 4y = 8 is dilated by a scale factor of 1.5 centered at the origin. Write the equation of the line after the dilation

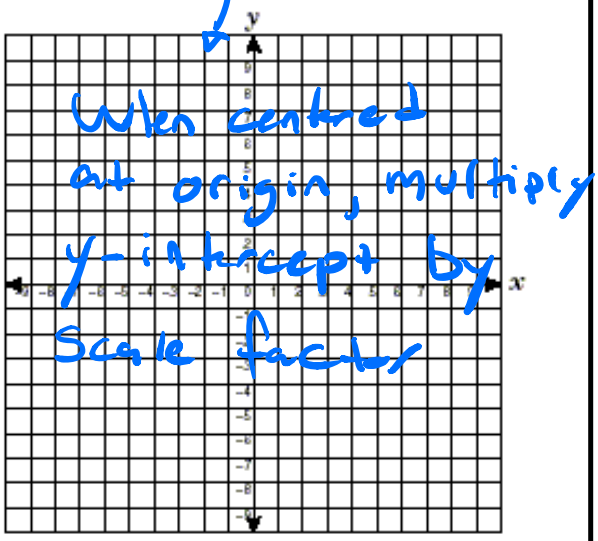
$3x - 4y = 8$

$-3x \qquad -3x$

$\frac{-4y}{-4} = \frac{-3x}{-4} + \frac{8}{-4}$

$y = \frac{3}{4}x - 2 \times 1.5$

$\boxed{y = \frac{3}{4}x - 3}$



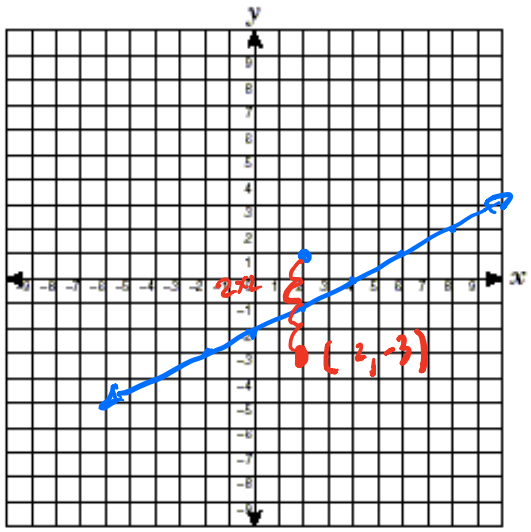
The line x - 2y = 4 is dilated by a scale factor of 2 centered at point (2,1). Write the equation of the line after the dilation

$x - 2y = 4$

$-x \qquad -x$

$\frac{-2y}{-2} = \frac{-x}{-2} + \frac{4}{-2}$

$y = \frac{1}{2}x - 2$



$y = mx + b$

$m = \frac{1}{2}$

$x = 2$

$y = -3$

$-3 = (\frac{1}{2})(2) + b$

$-3 = 1 + b$

$-1 \qquad -1$

$\boxed{-4 = b}$

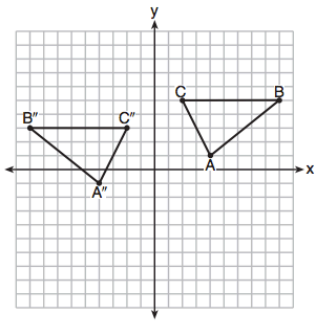
$\boxed{y = \frac{1}{2}x - 4}$

Level 1 Review

* Many possible answers

A translation 2 units down and a reflection over the y-axis maps $\triangle ABC$ onto $\triangle A''B''C''$

The graph below shows $\triangle ABC$ and its image, $\triangle A''B''C''$.

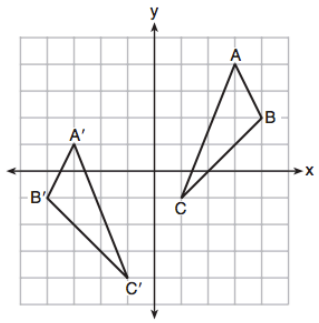


Describe a sequence of rigid motions which would map $\triangle ABC$ onto $\triangle A''B''C''$.

A translation 3 units down and a reflection over the y-axis maps $\triangle ABC$ onto $\triangle A'B'C'$

Translations and reflections are rigid motions and rigid motions preserve angle measures and side lengths.

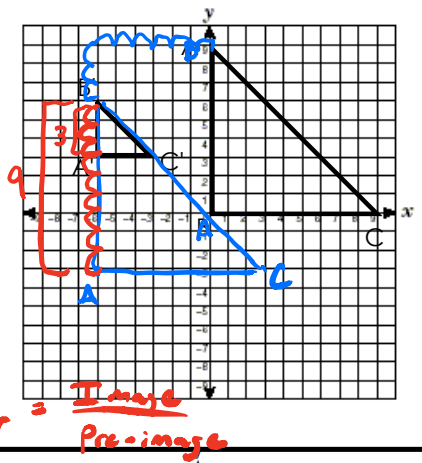
As graphed on the set of axes below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a sequence o transformations.



Is $\triangle A'B'C'$ congruent to $\triangle ABC$? Use the properties of rigid motion to explain your answer.

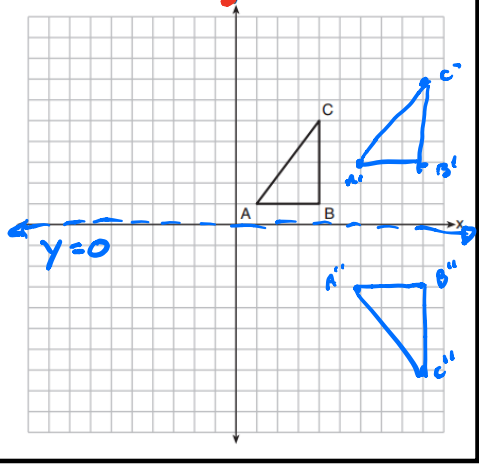
Describe a transformation that maps ABC onto A'B'C'

A translation 6 units left and 3 units down then a dilation centered at B' with a scale factor of $\frac{1}{3}$ will map $\triangle ABC$ onto $\triangle A'B'C'$



Scale factor = $\frac{\text{Image}}{\text{Pre-image}}$

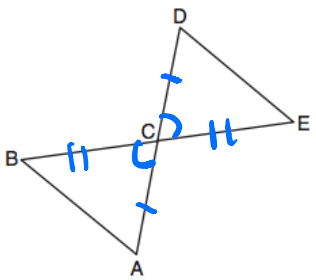
In the diagram below, $\triangle ABC$ has coordinates $A(1,1)$, $B(4,1)$, and $C(4,5)$. Graph and label $\triangle A''B''C''$, the image of $\triangle ABC$ after the translation five units to the right and two units up followed by the reflection over the line $y = 0$.



Level 2 Review

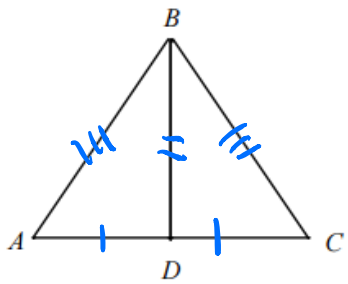
Given: $\overline{BE}$ and $\overline{AD}$ intersect at point C
$\overline{BC} \cong \overline{EC}$
$\overline{AC} \cong \overline{DC}$
$\overline{AB}$ and $\overline{DE}$ are drawn

Prove: $\triangle ABC \cong \triangle DEC$



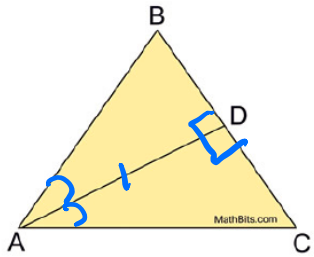
Statement	Reason
(1) $\overline{BC} \cong \overline{EC}$	(1) given
(2) $\overline{AC} \cong \overline{DC}$	(2) given
(3) $\angle DCE \cong \angle BCA$	(3) vertical $\angle$'s are $\cong$
(4) $\triangle ABC \cong \triangle DEC$	(4) SAS

Given: $\overline{BD}$ is the median to $\overline{AC}$,
$\overline{AB} \cong \overline{BC}$
Prove: $\angle CBD \cong \angle ABD$



Statement	Reason
(1) BD is median to AC	(1) given
(2) $\overline{AB} \cong \overline{BC}$	(2) given
(3) $\overline{BD} \cong \overline{BD}$	(3) Reflexive Prop
(4) $\overline{AD} \cong \overline{DC}$	(4) Median divides base in 2 $\cong$ parts
(5) $\triangle ABD \cong \triangle CBC$	(5) SSS
(6) $\angle CBD \cong \angle ABD$	(6) CPCTC

Given: $\overline{AD}$ bisects $\angle BAC$
$\overline{AD}$ is an altitude
Prove: ~~$\triangle ABC$~~ $\cong \triangle ADC$
$\triangle ADB$
Wrong!



Statement	Reason
(1) AD bisects $\angle BAC$	(1) given
(2) $\overline{AD}$ is an altitude	(2) given
(3) $\overline{AD} \cong \overline{AD}$	(3) Reflexive property
(4) $\angle BAD \cong \angle CAD$	(4) $\angle$ bisectors divide $\angle$ in 2 $\cong$ parts
(5) $\angle BDA$ and $\angle CDA$ are right $\angle$'s	(5) Altitude makes 90° $\angle$ with base
(6) $\angle BDA \cong \angle CDA$	(6) All right $\angle$'s are $\cong$
(7) $\triangle ADB \cong \triangle ADC$	(7) ASA