### Lesson 2 Practice Problems

1. Match each coordinate rule to a description of its resulting transformation.
	1. $\left(x,y\right)\rightarrow \left(x+3,y\right)$
	2. $\left(x,y\right)\rightarrow \left(2x,2y\right)$
	3. $\left(x,y\right)\rightarrow \left(x,y+4\right)$
	4. $\left(x,y\right)\rightarrow \left(x,y−4\right)$
	5. $\left(x,y\right)\rightarrow \left(x−3,y+4\right)$
	6. Translate by the directed line segment from $\left(0,0\right)$ to $\left(0,4\right)$.
	7. Translate by the directed line segment from $\left(0,0\right)$ to $\left(3,0\right)$.
	8. Dilate using the origin as the center and a scale factor of 2.
	9. Translate by the directed line segment from $\left(0,0\right)$ to $\left(0,-4\right)$.
	10. Translate by the directed line segment from $\left(0,0\right)$ to $\left(-3,4\right)$.
	11. Draw the image of triangle $ABC$ under the transformation $\left(x,y\right)\rightarrow \left(x−4,y+1\right)$. Label the result $T$.
	12. Draw the image of triangle $ABC$ under the transformation $\left(x,y\right)\rightarrow \left(-x,y\right)$. Label the result $R$.
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1. Here are some transformation rules. For each rule, describe whether the transformation is a rigid motion, a dilation, or neither.
	1. $\left(x,y\right)\rightarrow \left(x−2,y−3\right)$
	2. $\left(x,y\right)\rightarrow \left(2x,3y\right)$
	3. $\left(x,y\right)\rightarrow \left(3x,3y\right)$
	4. $\left(x,y\right)\rightarrow \left(2−x,y\right)$
2. Reflect triangle $ABC$ over the line $x=0$. Call this new triangle $A^{′}B^{′}C^{′}$. Then reflect triangle $A^{′}B^{′}C^{′}$ over the line $y=0$. Call the resulting triangle $A^{″}B^{″}C^{″}$.
* Which single transformation takes $ABC$ to $A^{″}B^{″}C^{″}$?
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	1. Translate triangle $ABC$ by the directed line segment from $\left(1,1\right)$ to $\left(-2,1\right)$.
	2. Reflect triangle $ABC$ across the line $y=-x$.
	3. Rotate triangle $ABC$ counterclockwise using the origin as the center by 180 degrees.
	4. Dilate triangle $ABC$ using the origin as the center and a scale factor of 2.
* (From Unit 6, Lesson 1.)
1. Reflect triangle $ABC$ over the line $y=2$.
* Translate the image by the directed line segment from $\left(0,0\right)$ to $\left(3,2\right)$.
* What are the coordinates of the vertices in the final image?
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* (From Unit 6, Lesson 1.)
1. The density of water is 1 gram per cm3. An object floats in water if its density is less than water’s density, and it sinks if its density is greater than water’s. Will a cylindrical log with radius 0.4 meters, height 5 meters, and mass 1,950 kilograms sink or float? Explain your reasoning.
* (From Unit 5, Lesson 17.)
1. These 3 congruent square pyramids can be assembled into a cube with side length 3 feet. What is the volume of each pyramid?
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	1. 1 cubic foot
	2. 3 cubic feet
	3. 9 cubic feet
	4. 27 cubic feet
* (From Unit 5, Lesson 12.)
1. Reflect square $ABCD$ across line $CD$. What is the ratio of the length of segment $AA^{′}$ to the length of segment $AD$? Explain or show your reasoning.
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* (From Unit 2, Lesson 1.)



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