

# **Eighth Grade ELA & Mathematics Week 3 Packet**



**First & Last Name:** \_\_\_\_\_

**Teacher:** \_\_\_\_\_

**Grade:** \_\_\_\_\_

**School:** \_\_\_\_\_



Read the scientific account. Then answer the questions that follow.

## Animal Regeneration

*by Aleya Brown*

1       Regeneration is the ability of an organism to regrow a lost body part. All creatures have the power to regenerate lost body parts to some degree. If a human scrapes a knee or breaks a bone, for example, tissue is regenerated to heal the wound. Even a lost fingernail will regenerate over time. If the finger is severed, however, the limits of regeneration have been reached; humans cannot regrow limbs or organs. In contrast, if an earthworm is cut in half, the end of the worm with a head can grow a new tail. If the end of the worm with the tail survives, it too may grow a new tail. Unfortunately, it starves to death eventually because it cannot feed itself without a head or mouth.

2       Which creatures have strong regenerative powers? Lower animals, such as worms, lizards, spiders, and starfish, have some of the greatest regenerative powers. Crayfish, for example, have a remarkable safety device at the base of each claw and leg called a “breaking joint.” When a predator grabs a limb or claw, the appendage breaks away so the crayfish can escape. Over time, as the crayfish molts, or sheds its soft shell, the broken limb or pincer grows larger and larger until it has been completely regenerated.

3       Some animals are able to survive in large part because of their regenerative powers. A type of flatworm called planaria lives under rocks in clear creeks and streams. The flatworm has no real defense mechanisms to protect it from predators, but it can be cut into as many as 32 pieces, and each piece may form a new worm, complete with a head, eyes, and internal organs. In the case of the planaria, an event that could be fatal is turned into an awesome act of procreation.

4       Many more animals display noteworthy regenerative powers. Sharks replace lost teeth throughout their lifetimes. A single shark may grow as many as 24,000 teeth in its lifetime, ensuring a long career at the top of the food chain. Much like planaria, sea cucumbers, which have bodies that grow up to three feet long, can be cut into pieces and survive. Each piece may grow into a new sea cucumber. Spiders, like crayfish, can regrow legs. Many lizards also have “breakaway” tails that snap off when caught by predators. They then grow new ones, which lack the original spine. Starfish can lose arms and grow new ones. Sometimes an entirely new starfish can grow from a single lost arm.

5       Interestingly enough, the scales of a fish tell stories about regeneration. Much like the rings inside a tree trunk, fish scales reveal details about an organism’s past. Each scale lies in a pocket of skin and grows along with the fish. Scientists read the markings on a scale to determine the age of the fish, seasons of famine or drought, and other important information. It is often necessary to look at many scales to get a complete story, however, because scales are often lost and regenerated. These new scales lack the markings that happen over time. They are like a blank page in the history of the fish.



6 Scientists are extremely interested in regeneration because of the possible implications for healing humans. Some scientists think it is possible that higher animals retain the ability to regenerate body parts, but that the reaction triggering the body to regenerate has been lost. By studying lower animals, such as worms, spiders, and sponges, scientists hope to discover what triggers regeneration. The dream is that this knowledge could one day be used to help humans regrow internal organs and limbs. Currently, human regeneration may sound like something out of a science-fiction movie. The implications of such a discovery, however, would be so far-reaching that they are hard to fathom. For now, the miracle of regeneration is intriguing enough to keep scientists working for years to come.

Answer the questions. Mark your answers to questions 1–5 on the Answer Form to the right.

**Answer Form**

1 (A) (B) (C) (D)

2 (A) (B) (C) (D)

3 (A) (B) (C) (D)

4 (A) (B) (C) (D)

5 (A) (B) (C) (D)

**Number  
Correct****5**

**1** What is the meaning of “procreation” as it is used in paragraph 3 of the passage?

- A** survival
- B** repetition
- C** cooperation
- D** reproduction

**2** Read this sentence from the passage.

Crayfish, for example, have a remarkable safety device at the base of each claw and leg called a “breaking joint.”

Which of the following best matches the author’s connotative meaning of the word “remarkable” as it is used in the sentence?

- A** unusual
- B** significant
- C** extraordinary
- D** noticeable



**3** As used in paragraphs 2, 3, and 4 of the passage, the word *powers* is **closest** in meaning to

- A** influence
- B** authority
- C** forcefulness
- D** abilities

**4** Which of the phrases from the passage **best** helps the reader understand the meaning of the word “appendage”?

- A** “have a remarkable safety device”
- B** “grabs a limb or claw”
- C** “sheds its soft shell”
- D** “grows larger and larger”

**5** Read this sentence from the passage.

The dream is that this knowledge could one day be used to help humans regrow internal organs and limbs.

Which word **best** matches the meaning of “dream” as it is used in this sentence?

- A** hope
- B** fantasy
- C** plan
- D** illusion



**Self Check**

***Go back and see what you can check off on the Self Check on page 94.***

## Reading

Read the passage. Then answer the questions that follow.

# The Glowing Beagle

by Karen Brinkmann

1 Dogs have provided many services for people over the years. Working and herding dogs pull sleds and shepherd animals. Service dogs guide and protect people with special needs. Police dogs assist in tracking down and apprehending criminals. Assistance dogs perform necessary tasks for people. And of course, dogs are probably best known for their faithful companionship to individuals and families.

2 But dogs may soon be able to add another talent to their long list of abilities: the potential to help researchers cure diseases because of the dogs' ability to glow. Yes, you read that correctly: scientists in Korea have designed and bred a dog that glows under ultraviolet light. Let's take a look at this unprecedented scientific creation in order to understand why it was accomplished as well as how it could help doctors study and eradicate diseases.

3 For many years, scientists have studied bioluminescent sea creatures such as jellyfish. *Bioluminescent* means a creature can produce and emit its own light. After years of observing and experimenting with these types of creatures, scientists discovered a protein called *green-fluorescent protein*, which is responsible for giving the jellyfish and other creatures the ability to glow. They determined a way to isolate the protein. Then, they transferred it into the cells of a puppy before the puppy was even born. The result was a delightful dog named Tegan who is like any other beagle except that she appears to glow when placed under an ultraviolet light.

4 You may be wondering how in the world a glowing beagle pup could possibly help researchers find a cure for diseases such as Alzheimer's and Parkinson's. The answer to that question lies not in the fact that the dog glows but that scientists have created a method to transfer genes. Because the gene transfer process has been successful, scientists are hopeful that other gene transfers will also be successful. And these gene transfers could lead to a better understanding, if not a cure, for many different kinds of diseases.

5 Human beings and dogs share the ability to contract 268 genetic diseases. If scientists can successfully conduct research on a dog that has a disease that a human can also develop, the scientists may find clues to curing that disease by observing the dog. Dogs share some of the same physiological and anatomical body parts that people do, so studies of dogs translate well to studies of humans. Plus, dogs are social creatures and respond well to commands. They are better subjects to study than laboratory rats or mice.

6 Though transferring fluorescent genes to a dog does not harm a dog in any way, there are some critics of the process. Some animal rights groups discourage any testing on animals. Many suggest alternatives to animal testing, including testing humans instead. However, though many studies have been conducted using human volunteers, the type of gene testing that scientists have done on dogs cannot be conducted on humans.

**Go On**

7 Another drawback of the program is the expense. Scientific research is typically costly, but genetic testing requires equipment and technology that come at a very high price. Additionally, testing on dogs would require that researchers find caregivers for the dogs. Small creatures such as mice and rats can live happily in small cages, but dogs of course cannot. Researchers who want to dedicate their lives to performing gene transfers on pups would need to find a way to house the dogs in a humane way.

8 Still, scientists are optimistic. They see great potential in these developments and hope that the future of scientific research on genes is bright, not only for humans, but for their best friends, the dogs.

---

**1** This question has two parts. First, answer part A. Then, answer part B.

**Part A**

What is one central idea of the article?

- A** Dogs are known for their loyal and devoted companionship to humans.
- B** Bioluminescent sea creatures may help researchers cure diseases such as Parkinson's.
- C** It is safer and easier to conduct research on dogs than on humans.
- D** Glowing beagles could help doctors effectively treat human diseases.

**Part B**

Which sentence from "The Glowing Beagle" **best** supports the answer to part A?

- A** "For many years, scientists have studied bioluminescent sea creatures such as jellyfish."
- B** "If scientists can successfully conduct research on a dog that has a disease that a human can also develop, the scientists may find clues to curing that disease by observing the dog."
- C** "However, though many studies have been conducted using human volunteers, the type of gene testing that scientists have done on dogs cannot be conducted on humans."
- D** "They see great potential in these developments and hope that the future of scientific research on genes is bright, not only for humans, but for their best friends, the dogs."

**2**

Look at the first sentence of the passage.

Dogs have provided many services for people over the years.

What relationship does this sentence have with the rest of the first paragraph?

- A** It introduces a problem. The rest of the paragraph lists possible solutions.
- B** It states an observed effect. The rest of the paragraph examines causes.
- C** It provides an opinion. The rest of the paragraph provides reasons.
- D** It presents an idea. The rest of the paragraph gives examples.

**3**

Which of the following gives the **best** summary of the ideas in “The Glowing Beagle”?

- A** Some animals, such as jellyfish, can produce their own light. By transferring the light-producing gene to dogs, scientists have found a way to make dogs glow when placed under ultraviolet light. This could lead to important discoveries.
- B** The fascinating study of bioluminescent sea creatures has led to new research for curing diseases. However, scientists now cruelly perform tests, such as gene transfers, on live animals.
- C** By successfully transferring genes from light-producing sea creatures to dogs, scientists have found a way to study and possibly cure diseases in people. Though there are several drawbacks, scientists are hopeful that the challenges can be overcome.
- D** Scientists have discovered a cure for Alzheimer’s disease. By transferring genes from bioluminescent sea creatures to dogs, researchers discovered where disease-producing genes can be found. They found ways to prevent these genes from becoming active.

***Go On***

4

The author believes the gene transfer process is a positive discovery, but she also wants to acknowledge that there are people who oppose it. Which sentence from the passage **best** supports this statement?

- A** "And of course, dogs are probably best known for their faithful companionship to individuals and families."
- B** "The result was a delightful dog named Tegan who is like any other beagle except that she appears to glow when placed under an ultraviolet light."
- C** "Though transferring fluorescent genes to a dog does not harm a dog in any way, there are some critics of the process."
- D** "Small creatures such as mice and rats can live happily in small cages, but dogs of course cannot."
- E** "They see great potential in these developments and hope that the future of scientific research on genes is bright, not only for humans, but for their best friends, the dogs."

5

Below are three claims that one could make based on the article "The Glowing Beagle."

Claims	
	Gene transfers are an important breakthrough that could greatly benefit humans.
	Because of their similarity to humans, dogs are some of the best research subjects.
	Genetic testing is too costly and controversial to hold much promise.

Draw an X by the claim that is supported by the **most** relevant and sufficient evidence within "The Glowing Beagle." Then write down two sentences from the article that **best** provide evidence to support the claim selected in part A.

First sentence: \_\_\_\_\_

\_\_\_\_\_

Second sentence: \_\_\_\_\_

\_\_\_\_\_



## Reading

Read the passage. Then answer the questions that follow.

# Cars Without Gasoline Are Here

*by Caroline Rialto*

1 People often feel as if the use of a gasoline engine has been integral to the automobile for as long as cars have been on the road. Justifiably, this makes people resist change. They feel that if the gasoline engine disappears, automobiles will never be as fast, safe, or comfortable as they are now, much like people must have felt as the car replaced the horse-drawn carriage.

2 But in fact, the first automobiles were really locomotives modified with tires. They were powered mostly by steam engines. Some early cars ran on strange fuels like gunpowder and coal gas. And some early cars were even powered by simple batteries and electric motors.

3 So the history of the early automobile is a history of changing technology, and of trying things and seeing if they work. Today, technology is changing because political and environmental concerns are forcing manufacturers away from the gasoline engine. The Earth's survival depends on our response to energy issues today. Plus, the price of gas is rising, which means new technologies must be invented to utilize other forms of energy. Because of these factors, we are experiencing a return to that glorious era of experimentation. In the same way as early automobile inventors, we're trying things and seeing if they work.

4 Biodiesel is a chemical very much like the diesel fuel that trucks and some cars use. But instead of being made from crude oil, it is made from renewable sources such as vegetable oil or animal fats. Biodiesel can provide much better fuel efficiency than gasoline. It can be made anywhere. Plus, many cars that now use diesel can be converted to run on biodiesel, so biodiesel could be very cost-effective.

5 Ethanol is another fuel-based alternative to gasoline power. Bioethanol, made from many common crops grown in the United States, could be a main fuel for the future of transportation. Ethanol is already added to fuels to reduce the amount of gasoline our cars consume.

6 Another set of alternative technologies uses natural gas or locally made biogas to power cars. Though natural gas is itself a fossil fuel, it burns very cleanly, so it does not pollute as much as gasoline. Biogas, made from decomposing organic matter, is a more environmentally conscious choice that has the same advantages.

7 Hybrid technology allows another route to gasoline-free driving. A hybrid car uses a small conventional engine, but gets added power through one or more electric motors linked to a set of batteries. The batteries are charged by excess power from the engine and from energy recaptured from braking. The electric motor supplements the conventional engine during peak loads, often providing full power at low speeds. The conventional engine takes over at higher speeds, often around 30 miles per hour. The most successful commercial hybrids today use a gasoline engine, but the technology could easily be used with biodiesel, bioethanol, or biogas to provide a fossil-fuel-free transportation technology.

**Go On**

8 So far we've been looking at vehicles that represent small improvements. But some new technologies are more boldly changing the face of motoring. The fully electric car does away with the conventional motor altogether, using only electric motors and battery packs. However, the limited state of battery technology today means that such vehicles rarely have real-life ranges of more than 100 miles. They can also take many hours to charge up. But there is another option. The plug-in hybrid is very much like normal hybrid technology, but it adds the capacity to be charged from a wall plug like an electric car. That way, drivers can charge the cars overnight and have them ready in the morning. Such vehicles generally use the electric motor almost exclusively until the battery pack is exhausted. This means that the car may use little fuel or no fuel at all during shorter trips.

9 Batteries are heavy. And, as we've seen, they have short range and long charging times. If we want to avoid pollution completely, there are two revolutionary fuel technologies also being deployed. For short trips inside of cities, vehicles powered off of compressed air could be valuable. Such a vehicle would emit no pollutants. It could be pumped up at stations throughout the city and would provide ample power for urban environments. For longer trips, hydrogen could be used as a fuel. Hydrogen can be safely stored in a compressed tank or incorporated into cutting-edge materials. It can be combined with oxygen from the air to produce energy that can be used to power a car. The only emission from a hydrogen-powered vehicle would be pure water. Plus, hydrogen is the most abundant natural element in the universe, so there is plenty of it around.

10 Future road cars will combine many of these technologies to provide maximum efficiency. But one thing is certain: Cars will surely get better for the consumer.

---

**1** This question has two parts. First, answer part A. Then, answer part B.

**Part A**

Which meaning of the word "hybrid" **best** defines the use of the word in the passage?

- A** the offspring of two different biological beings
- B** a word that contains elements of two or more languages
- C** a custom born out of the interaction of two or more cultures
- D** something that draws on multiple sources of power

**Part B**

Which of the phrases from the passage **best** helps the reader understand the meaning of "hybrid"?

- A** "replaced the horse-drawn carriage"
- B** "supplements the conventional engine"
- C** "use the electric motor"
- D** "combined with oxygen"

**2**

Which of the following sentences from "Cars Without Gasoline Are Here" suggests that the development of "green" technology is being influenced by forces outside the auto industry?

- A** "So the history of the early automobile is a history of changing technology, and of trying things and seeing if they work."
- B** "Today, technology is changing because political and environmental concerns are forcing manufacturers away from the gasoline engine."
- C** "Ethanol is already added to fuels to reduce the amount of gasoline our cars consume."
- D** "Future road cars will combine many of these technologies to provide maximum efficiency."

**3**

One of the author's main claims in "Cars Without Gasoline Are Here" is that the limited range of the electric car can be overcome. Which statement from the passage **best** supports this statement?

- A** "The Earth's survival depends on our response to energy issues today."
- B** "The fully electric car does away with the conventional motor altogether, using only electric motors and battery packs."
- C** "The plug-in hybrid is very much like normal hybrid technology, but it adds the capacity to be charged from a wall plug like an electric car."
- D** "Such a vehicle would emit no pollutants."

***Go On***

**4**

The author of "Cars Without Gasoline Are Here" claims that new technologies are changing the way modern automobiles are fueled. Which **three** details are irrelevant to this claim?

- A** Some early cars ran on gunpowder and coal gas.
- B** The survival of Earth hinges on our response to the energy crisis.
- C** Biogas powers cars and does not pollute as much as gasoline.
- D** The fully electric car is powered only by electric motors and battery packs.
- E** Hydrogen can be combined with oxygen from the air to power a car.
- F** Hydrogen is the most plentiful element in the universe.

**5**

How does the author make distinctions between the different types of automobiles she discusses in the article? Use **two** details from the passage to support your response.

---

---

---

---

---

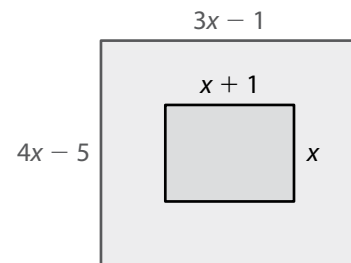
---

---

## Representing and Solving Problems with One-Variable Equations *continued*

- 5 Eli and Angela are saving money to buy their grandparents an anniversary gift. Eli has saved \$8 more than  $\frac{1}{3}$  of Angela's savings. If they each save \$10 more, Eli will have saved \$4 more than Angela's savings. How much has Eli saved?

- 6 The perimeter of the larger rectangle is 2 meters greater than twice the perimeter of the smaller rectangle. What is the perimeter of the larger rectangle?



# Solving Systems of Linear Equations by Substitution

► Find the solution of each system of equations.

1  $y = 2x - 1$   
 $y = 3x + 2$

---

2  $x = y + 4$   
 $2x + 2y = 16$

---

3  $x + y = 5$   
 $6x + 3y = 27$

---

4  $5x + 2y = 10$   
 $2x + y = 2$

---

5  $4x - 8y = -26$   
 $9x + 4y = 13$

---

6  $2x - 3y = 24$   
 $2x + y = 4$

---

7 How do you decide which variable to substitute when solving a system of equations by substitution? Explain.

# Solving Systems of Linear Equations by Elimination

► Find the solution to each system of equations.

1  $4x - 12y = -8$   
 $-3x + 12y = 12$

---

2  $6x - 9y = 18$   
 $-6x + 2y = -4$

---

3  $6x + 3y = 3$   
 $3x - y = 4$

---

4  $-3x + 2y = -17$   
 $-6x + 3y = -30$

---

5  $7x + 6y = 16$   
 $4x - 2y = 1$

---

6  $16x + 5y = -2$   
 $4x - y = -2$

---

7 When using the elimination method to solve a system of equations, how do you choose which variable to eliminate?

# Solving Real-World Problems with Systems of Linear Equations

► Solve the problems by solving a system of equations.

- 1 Otis paints the interior of a home for \$45 per hour plus \$75 for supplies. Shireen paints the interior of a home for \$55 per hour plus \$30 for supplies. The equations give the total cost for  $x$  hours of work for each painter. For how many hours of work are Otis's and Shireen's costs equal? What is the cost for this number of hours?

$$y = 45x + 75$$

$$y = 55x + 30$$

---

- 3 There are 47 people attending a play at an outdoor theater. There are 11 groups of people sitting in groups of 3 or 5. How many groups of each size are there?
- 
- 

- 2 Calvin has 13 coins, all of which are quarters or nickels. The coins are worth \$2.45. How many of each coin does Calvin have?
- 

- 4 Agnes has 23 collectible stones, all of which are labradorite crystals or galena crystals. Labradorite crystals are worth \$20 each, while galena crystals are worth \$13 each. Agnes earns \$439 by selling her entire collection. How many stones of each type did she sell?
- 
-



## Solving Real-World Problems with Systems of Linear Equations *continued*

- 5 A dog groomer buys 7 packages of treats. Gourmet treats are sold in packs of 2. Treats that help clean a dog's teeth are sold in packs of 5. The dog groomer buys 26 treats in all. How many packages of each did she buy?

---

---

- 6 Copland competes in 27 swimming events this season. He wins either first place or second place in each event. Copland has 3 more first-place wins than second-place wins. In how many events did he win first place, and in how many did he win second place?

---

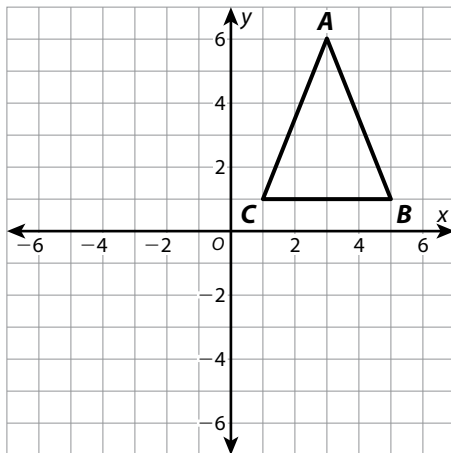
---

- 7 Choose one problem from problems 1–6. Check your answer by solving the system of equations in a different way.

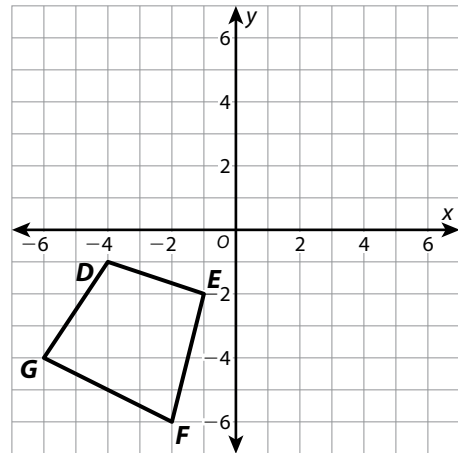
# Performing Sequences of Rigid Transformations

- Perform the given sequence of transformations on each figure. Write the coordinates of the vertices of the final image. Then tell whether the final image is congruent to the original figure.

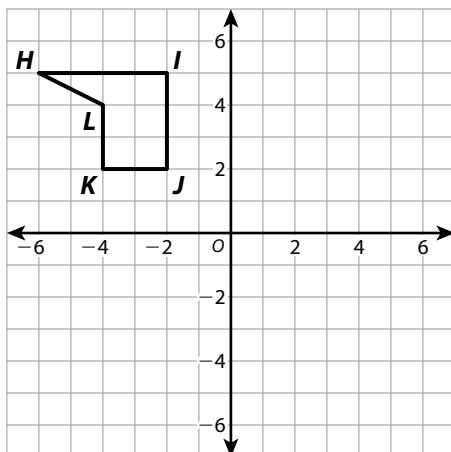
- 1 Reflect across the  $x$ -axis.  
Translate 5 units left.



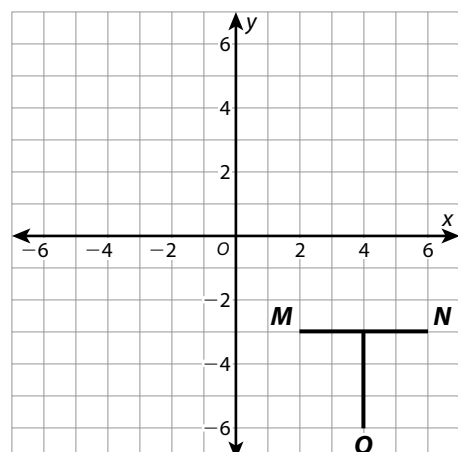
- 2 Rotate  $90^\circ$  clockwise around the origin.  
Reflect across the  $x$ -axis.



- 3 Translate 2 units right and 4 units down.  
Rotate  $180^\circ$  around the origin.

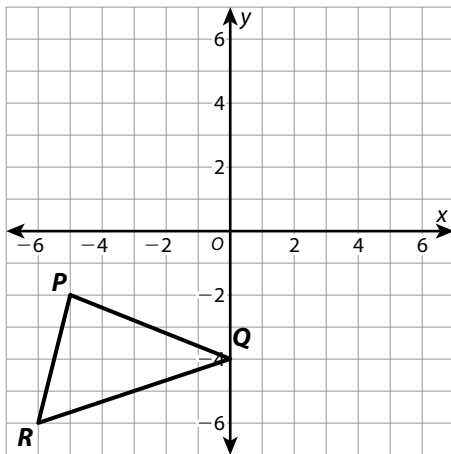


- 4 Reflect across the  $x$ -axis. Rotate  $90^\circ$  counterclockwise around the origin.

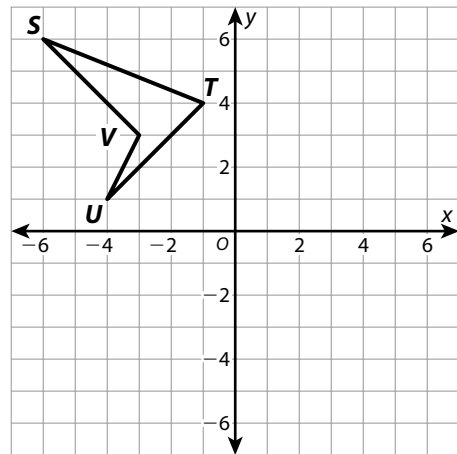


# Performing Sequences of Rigid Transformations *continued*

- 5 Reflect across the  $y$ -axis.  
Translate 5 units up.  
Rotate  $90^\circ$  clockwise around the origin.



- 6 Translate 6 units right.  
Rotate  $180^\circ$  around the origin.  
Reflect across the  $y$ -axis.

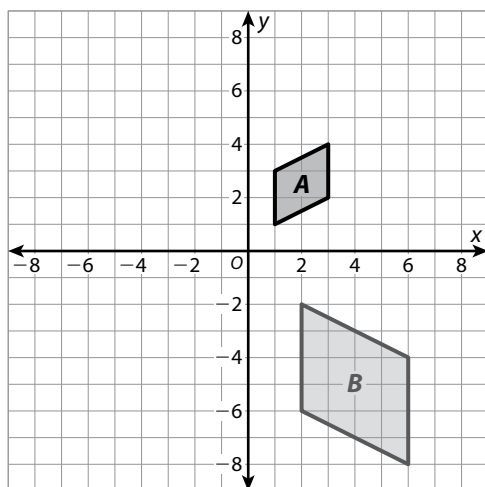


- 7 How did you determine the label for each vertex when you transformed the triangles in problem 5?

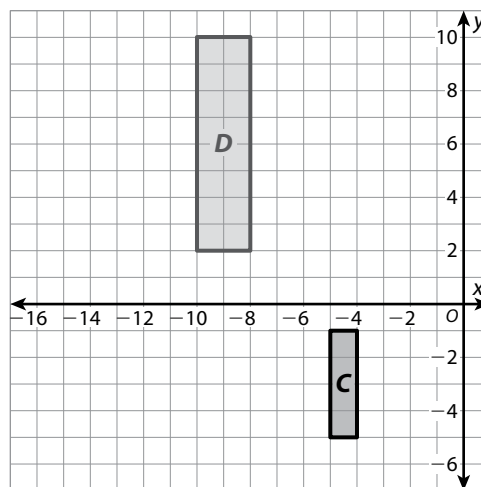
# Describing Sequences of Transformations Involving Dilations

- For each pair of figures, describe a sequence of three or fewer transformations that can be used to map one figure onto the other.

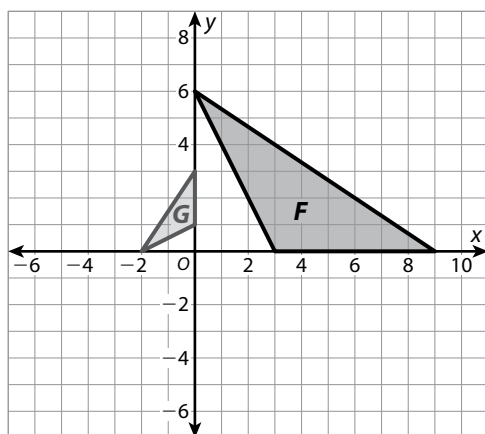
1



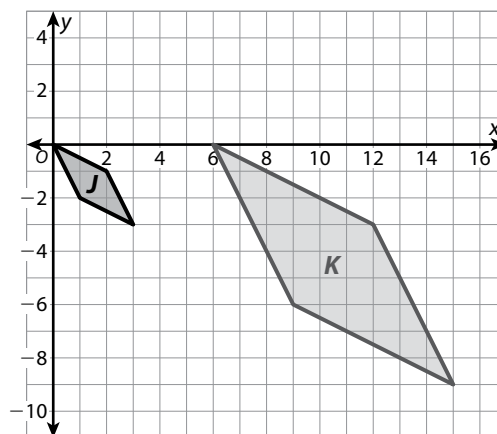
2



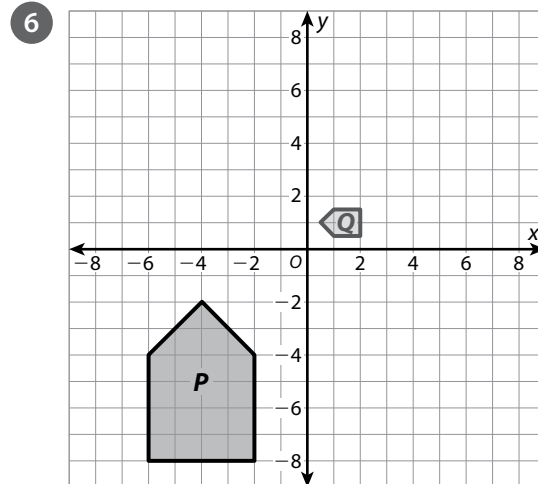
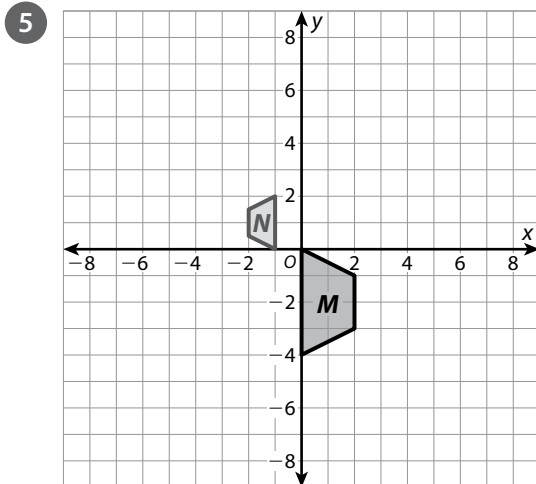
3



4



# Describing Sequences of Transformations Involving Dilations *continued*



- 7 Give an example of a sequence of transformations that can be performed in any order and will result in the same image.
- 8 Give an example of a sequence of transformations for which changing the order results in a different final image.