## AIMS Grade 5 Mathematics Sample Test and Think-Throughs

**FOR STUDENTS**

## GRADE 5
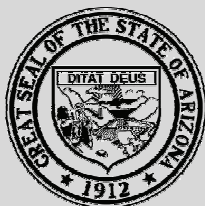
**Arizona Department of Education**
**John Huppenthal, Superintendent of Public Instruction**

## *Introduction*

**Dear Students,**

This AIMS sample test is meant to give you experience in taking AIMS.  The samples are not supposed to be a practice test.  They give you a sample of the kinds of questions that you can find on AIMS.  The best way to make sure you can Meet and Exceed on AIMS is to *be in class*, *be prepared*, and *be on time to class* each day.  Learning in class and through homework is the way to meet your goals on AIMS.

Sometimes students get nervous when taking tests.  They may need some help with test-taking strategies.  In this document, you can take an AIMS sample test for mathematics.  You will see that some of the items have explanations of how to solve the problems.  This will help you think through the questions, just like you do in class.  There are also more problems like the ones explained, so you can try them on your own or with your teacher.

When you look at the sample problems that show the solution process, you will also see listed on the answer key the Strand, Concept, and Performance Objective that is being measured.  This is listed so you can see how it connects to the lessons your teacher creates from the AZ Academic Standards.  Read through the samples and see how your thoughts and answers compare.

Good luck and have fun!

---

**Teachers – Please help your students understand the following important facts.**

- The AIMS Mathematics Sample Tests follow the AIMS mathematics blueprints for the 2008 Mathematics Academic Standards, but only represent half the number of items that are on the actual AIMS 3-8 and AIMS HS assessments.
- The best way to study for AIMS is to be sure students know and are able to do the grade-level performance objectives in each content area tested.  Your lessons based on all of these grade-level mathematics standards are the best way that students gain necessary knowledge.
- The activities contained in this document will give experience in taking AIMS.  It is not a practice test.  Students should practice by doing homework.
- Students should work through the sample test as if it is the AIMS – don't allow them to use a calculator or any other support materials.

# Mathematics Sample Test

# Grade 5

**Directions:** **Read each problem and select the best answer.**

**1** Logan Academy students take part in four field trips during the school year. They visit a library, a museum, a park, and a zoo. How many different ways can the four trips be ordered for the school year?

 A   4
 B   6
 C   16
 D   24

**2** A number cube is labeled with the digits 1 through 6. The cube is tossed once. What is the probability that the cube will land on either a 4 or a 6?

 A   $\frac{1}{2}$
 B   $\frac{1}{3}$
 C   $\frac{1}{4}$
 D   $\frac{1}{6}$

**3** A dolphin was swimming at 20 feet below sea level. Then it dove to 45 feet below its original position. Which integer represents the depth of the dolphin's dive?

 A   −45 feet
 B   −20 feet
 C   20 feet
 D   45 feet

**4** Which of the following would be **best** displayed on a double-line graph?

 A   the number of boys and girls in different classes at a school
 B   the favorite activities of the students in two different classes
 C   the change in temperature over the same period of time on two different days
 D   the change in the number of visitors to a museum at different times during one day

**5** What is the coordinate of point *A*?
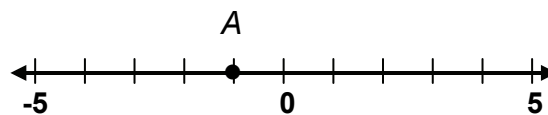


 A   −3
 B   −1
 C   1
 D   4

**6** Grace measures a bean plant at the end of every week. At the end of week 1, the plant is 4 inches tall. It grows $\frac{1}{2}$ inch each week for 5 more weeks. How tall is Grace's bean plant at the end of week 5?
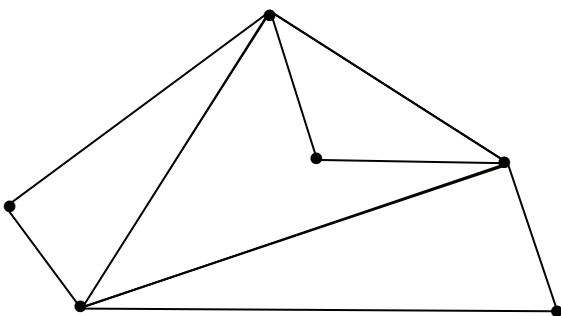
 A   5 inches
 B   $5\frac{1}{2}$ inches
 C   6 inches
 D   $6\frac{1}{2}$ inches

*Go On*▶

**7**  Ms. Cook's class bought 2 bags of concrete and some bricks to build a border for their class garden. The bricks cost $51. The total cost of the bricks and the concrete was $57. Which equations can be used to find the cost, $b$, of 1 bag of concrete?

**A**  $b + 51 = 57$

**B**  $2 + 51b = 57$

**C**  $2b + 51 = 57$

**D**  $2(51) + b = 57$

**8**  Look at the vertex-edge graph.



Which statement about the graph is true?

**A**  All vertices are of even degree.

**B**  No vertices are of even degree.

**C**  Only one vertex is of even degree.

**D**  Only three vertices are of even degree.

**9**  Students agree that the following equations using integers are true.

$$-1 + -1 = -2 \qquad -5 + -5 = -10 \qquad 3 + 2 = 5 \qquad 2 + 5 = 7$$

Which statement about adding integers is **not** true?

**A**  Adding integers is the same as adding whole numbers.

**B**  Adding two positive numbers results in a positive number.

**C**  Adding two negative numbers results in a negative number.

**D**  Adding integers with a common sign results in a sum with the same sign.

*Go On▶*

**10** Look at the graph.
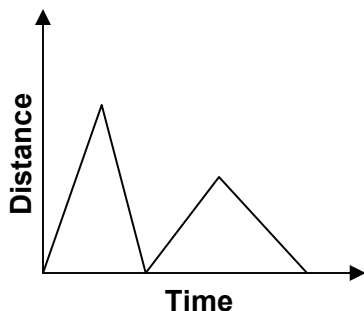


**Time**

Which situation is **best** represented by the graph?

**A**  Nora runs to school. Along the way, she stops to pet a dog.

**B**  Nora walks to the store, buys some books, and then walks home again.

**C**  Nora reads a book, then does her homework, then watches TV, and then listens to music.

**D**  Nora throws a ball into the air and catches it. Then she throws it into the air again and catches it.

**11** Sheri asks 83 students at school to choose the sports that they most enjoy watching. The students can choose from baseball, basketball, football, and soccer. The results are shown in the table.

**Sports Most Enjoyed by Students**

| Sport | Number of Students |
|---|---|
| Baseball | 12 |
| Basketball | 22 |
| Football | 28 |
| Soccer | 21 |

Which statement is a reasonable conclusion to make from the information in the table?

**A**  Not many students attend baseball games.

**B**  More students play football than any of the other three sports.

**C**  Students watch more basketball games than watch football games.

**D**  Fewer students enjoy watching soccer games than enjoy watching football games.

*Go On*▶

**12** Scott ran in a two-day race. The first day he ran $5\frac{3}{4}$ miles. The next day he ran $6\frac{5}{8}$ miles. How many total miles did Scott run?

**A** $11\frac{3}{8}$

**B** $11\frac{2}{3}$

**C** $12\frac{3}{8}$

**D** $12\frac{3}{4}$

**13** What is the solution to the equation?

$$72,658 \div 313 =$$

**A** 200 R58

**B** 230 R68

**C** 231 R55

**D** 232 R42

**14** To place $0.67, \frac{3}{4}$, and 34% in order from least to greatest, John changes $\frac{3}{4}$ to 0.75 and 34% to 0.34. Then he uses the three decimals to correctly place the original numbers in order from least to greatest: 34%, 0.67, $\frac{3}{4}$. Which problem is best solved by using this same strategy?

**A** What is 80% of 75?

**B** What is the sum of $\left(4 + \frac{1}{5}\right) + \frac{2}{5}$ ?

**C** What is the solution to 100 − 0.73?

**D** What symbol completes the inequality $0.70 \boxed{\phantom{x}} \frac{4}{5}$ ?

**15** What is the area of the shaded figure?



represents 1 square unit
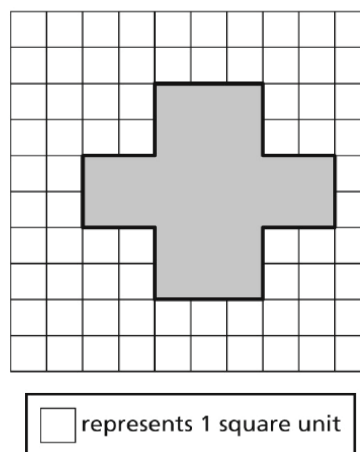
**A** 20 square units

**B** 22 square units

**C** 26 square units

**D** 28 square units

**16** The diagram below shows the length and width of the wall that Tara is going to cover with wallpaper.

24 feet

15 feet
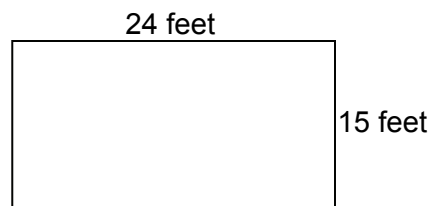
What is the least amount of wall paper Tara will need to cover the entire area of the wall?

**A** 39 square feet

**B** 78 square feet

**C** 350 square feet

**D** 360 square feet

*Go On▶*

**17** Samantha and Pedro each have 2 fair number cubes. The faces of each cube are numbered 1 through 6. They each rolled their 2 number cubes 50 times and recorded the sum of the numbers rolled. The table shows their results.

**Samantha's Results**

| Sum | Frequency |
|-----|-----------|
| 2 | II |
| 3 | III |
| 4 | IIII |
| 5 | ৸HL |
| 6 | ৸HL III |
| 7 | ৸HL ৸HL I |
| 8 | ৸HL I |
| 9 | IIII |
| 10 | III |
| 11 | III |
| 12 | I |

**Pedro's Results**

| Sum | Frequency |
|-----|-----------|
| 2 | II |
| 3 | IIII |
| 4 | IIII |
| 5 | ৸HL |
| 6 | ৸HL III |
| 7 | ৸HL IIII |
| 8 | ৸HL II |
| 9 | ৸HL |
| 10 | IIII |
| 11 | I |
| 12 | I |

Based on the data in the tables, which statement is **not** true?

**A**   The sum of 13 will never occur.

**B**   The sum of 7 has the greatest probability.

**C**   The sums 3, 5, 7, 9, and 11 are equally likely.

**D**   The sums of 2 and 12 have the least probability.

**18** A diagram of Ryan's yard is shown.
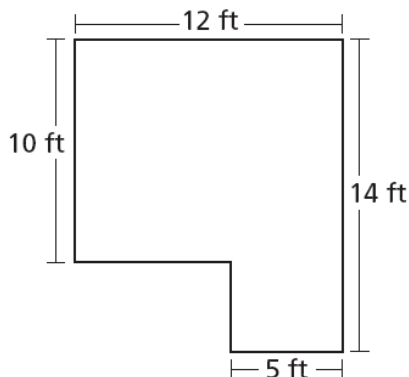


Which expression can Ryan use to find the total area of his yard?

**A**   (10 + 4) X (12 + 5)

**B**   (10 + 4) X (12 – 5)

**C**   (12 X 10) – (5 X 4)

**D**   (12 X 10) + (5 X 4)

*Go On▶*

**19** What is the solution to the equation?

$$5 + 9 \times 21 =$$

**A** 35

**B** 66

**C** 194

**D** 294

**20** Which list shows all of the prime numbers between 0 and 22?

**A** 1, 3, 5, 7, 11, 13, 19

**B** 2, 3, 5, 7, 11, 13, 17, 19

**C** 2, 4, 6, 8, 10, 12, 14, 15, 16, 18, 20, 21

**D** 1, 2, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21

**21** Which number is closest to the answer to the problem below?

$$39 \times 62$$

**A** 3900

**B** 2400

**C** 1800

**D** 1000

**22** What is the next term in the pattern?

1.25, 1.95, 2.65, 3.35, …

**A** 4.05

**B** 4.15

**C** 4.45

**D** 4.55

**23** Which value for *x* makes the number sentence true?

$$3x + 10 = 19$$

**A** 3

**B** 6

**C** 9

**D** 27

**24** Look at the number pattern.

$$\frac{1}{4}, \ 1\frac{1}{2}, \ 2\frac{3}{4}, \ 4, \ ...$$

What rule is used to get the next term?

**A** add $\frac{1}{4}$

**B** add $\frac{3}{4}$

**C** add 1

**D** add $1\frac{1}{4}$

**25** Two angles of a triangle add up to 65°. What is the measure of the third angle?

**A** 25°

**B** 55°

**C** 115°

**D** 295°

**26** What is $\frac{3}{5}$ written as a percent?

**A** 15%

**B** 30%

**C** 45%

**D** 60%

*Go On▶*

**27** Erika is baking cupcakes. The recipe calls for $1\frac{1}{4}$ cups of sugar for the batter, and $1\frac{2}{3}$ for the frosting. About how many total cups of sugar will Erika need for her recipe?

**A**   1 cup

**B**   2 cups

**C**   3 cups

**D**   4 cups

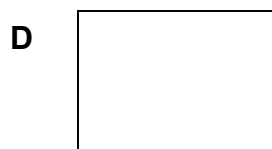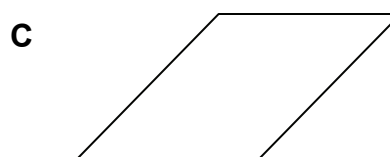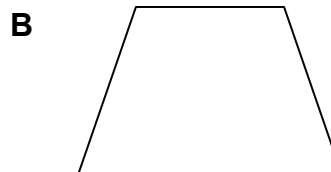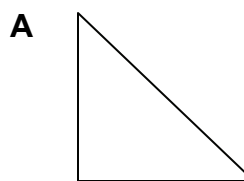**28** What is the mean of the numbers listed below?

31, 42, 46, 47, 51, 51, 68

**A**   37

**B**   47

**C**   48

**D**   51

**29** Roberto began his homework at 4:25 p.m. He finished it one and a half hours later. At what time did Roberto finish his homework?

**A**   5:05 p.m.

**B**   5:55 p.m.

**C**   6:05 p.m.

**D**   6:15 p.m.

**30** Which figure has only one pair of parallel sides?

**A**

**B**

**C**

**D**

**31** What is the solution to the expression?

$$3 - 4\left(\frac{1}{2}\right) + 7$$

**A**   3

**B**   $6\frac{1}{2}$

**C**   $7\frac{1}{2}$

**D**   8

*Go On*▶

**32** Sand Dollar Elementary is planning a school field trip for its fourth and fifth grade students. The locations that the students visit will depend on their names. The chart below shows the options for the field trip locations.

**Sand Dollar Elementary Field Trip Locations**

| Last Name Beginning Letter | | Zoo | Park | Museum | Theater |
|---|---|---|---|---|---|
| | | | | Location | |
| 4th Grade | A – G | | X | | |
| | H – R | X | | | |
| | S – Z | | | | X |
| 5th Grade | A – G | | | X | |
| | H – R | | X | | |
| | S – Z | X | | | |

Based on the information in the chart, which statement is true?

**A**   If Jenny Rodriguez goes to the Zoo, then she is in 5th grade.

**B**   If Simon Chen is in 5th grade, then he is going to the Museum.

**C**   If Ben Williams goes to the Theater, then he is in 5th grade.

**D**   If Maria Jones is in 4th grade, then she is going to the Park.

**33** What is the solution to the equation?

$$7400.05 - 526.175 =$$

**A**   3861.70

**B**   6873.875

**C**   6874.975

**D**   7926.225

## *AIMS Grade 5 Mathematics Think-Throughs & Practice Applications*

The problems on the next few pages are from the sample test you just finished. They have been worked out for you to show the thought process behind finding the answers.

As you go through them, see how your thoughts compare to the ones given. Not every problem from the sample test will be shown in this same way.

The number for each problem matches the same number that is in the sample test. This way, if you got the problem incorrect, you can compare your answers and go back to see what you may have done differently.

Then, after each Think-Through problem, you will see two more problems. You can apply what you just learned from the Think-Through problems. These will be very similar to the Think-Through problem. They are also testing the same academic performance objective. This will give you even more practice to think through your own problem-solving process.

As you read through the solution process of the problems, you may notice that some of the words are *italicized*. This means that it is a mathematics term that would be helpful to know.

After the two extra problems, there will be a Summary Statement which explains what the problems are testing. Your teacher can use this to help you understand what each problem is testing. It will help you both to understand which concepts you may need more work on or which concepts you may have mastered.

**3**     A dolphin was swimming at 20 feet below sea level. Then it dove to 45 feet below its original position. Which integer represents the depth of the dolphin's dive?

**A**   –45 feet

**B**   –20 feet

**C**    20 feet

**D**    45 feet

What is this problem asking me to do?  The question is asking me to identify which integer represents the depth of the dolphin's dive.  First I need to make sure I understand the whole problem.

- It says that the dolphin was swimming at 20 feet below sea level.  I know this means the dolphin was swimming 20 feet below the top of the water.
- Then, the dolphin dove to 45 feet below its original position.  That means it went down 45 more feet from the original 20 feet below that it was already swimming.

It may help me to draw a diagram to show what I am thinking.

sea level

dolphin at original position of –20 feet

–45 feet
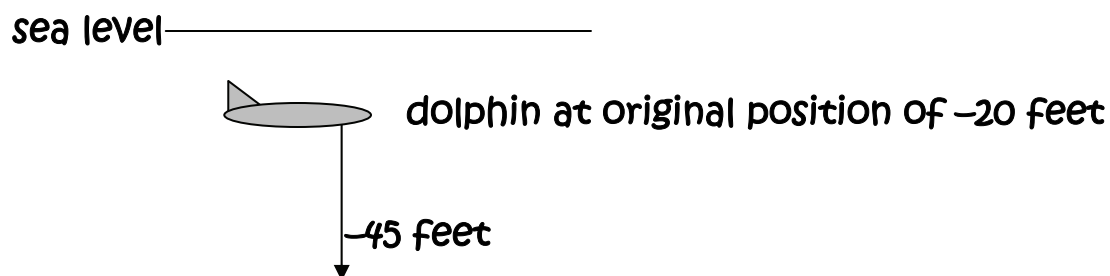
Now I look back at the question again, "Which integer represents the depth of the dolphin's dive?" So, I am only finding the number that represents the distance the dolphin dove.  I can see from the words in the problem and from the picture I drew, that the dolphin dove 45 feet down.  And when you go down 45 feet, that is the same as writing –45.  This is answer choice **A**.

**3a**   The temperature in Flagstaff was –5°C when Sandy went to bed. The temperature dropped 20°C during the night.  Which integer represents the change in temperature?

A   –25°C

B   –20°C

C    20°C

D    25°C

**3b**   The Hornet's soccer team scored 5 goals in their last match. The other team, the Panthers, won by 3 goals. Which integer represents the number of goals that the Panthers won by?

A   +2

B   +3

C   +5

D   +8

**Summary Statement:**

These problems involve expressing or interpreting positive and negative numbers in context.

**6**     Grace measures a bean plant at the end of every week. At the end of week 1, the plant is 4 inches tall. It grows $\frac{1}{2}$ inch each week for 5 more weeks. How tall is Grace's bean plant at the end of week 5?

    **A**    5 inches

    **B**    $5\frac{1}{2}$ inches

    **C**    6 inches

    **D**    $6\frac{1}{2}$ inches

---

This problem looks like it has to do with measurement over time. I have to figure out how tall the plant is based on the information given.

- **at the end of week 1, the plant is 4 inches tall**
- **it grows $\frac{1}{2}$ inch each week for 5 more weeks**

I will make a table to better explain this information.

At the end of week 1, Grace's plant is 4 inches tall.

Then, each week it grows $\frac{1}{2}$ inch for 5 more weeks.

The question wants to know how tall the bean plant is at the **end of week 5**.

| Week | Growth | Height |
|------|--------|--------|
| 1 | -------- | 4 inches |
| 2 | $\frac{1}{2}$ | $4\frac{1}{2}$ inches |
| 3 | $\frac{1}{2}$ | 5 inches |
| 4 | $\frac{1}{2}$ | $5\frac{1}{2}$ inches |
| 5 | $\frac{1}{2}$ | 6 inches |
| 6 | $\frac{1}{2}$ | $6\frac{1}{2}$ inches |

From the table that I made, I can see that Grace's bean plant is 6 inches at the end of week 5, which is answer choice **C**.

**6a** When Lily was 7 years old, she earned an allowance of $2.00 each week. Every year, her parents give her a raise of $0.50 a week. If this rate continues, what will Lily's allowance be when she is 11 years old?

A $2.00 each week

B $2.50 each week
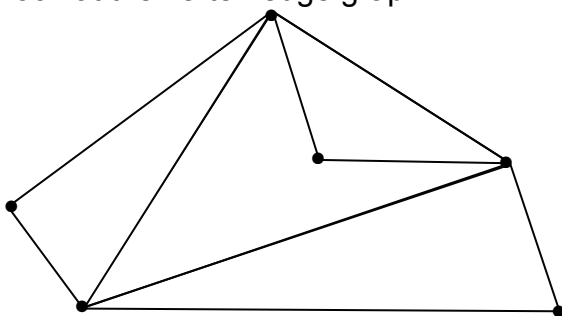
C $3.50 each week

D $4.00 each week

**6b** Jack's puppy weighs 11 pounds and it is 1 year old. If the puppy gains 2 pounds each year, how much will it weigh when it is 3 years old?

A 13

B 15

C 17

D 19

**Summary Statement:**
These problems involve using ratios and unit rates to model, describe, and extend problems in context.

**8** Look at the vertex-edge graph.
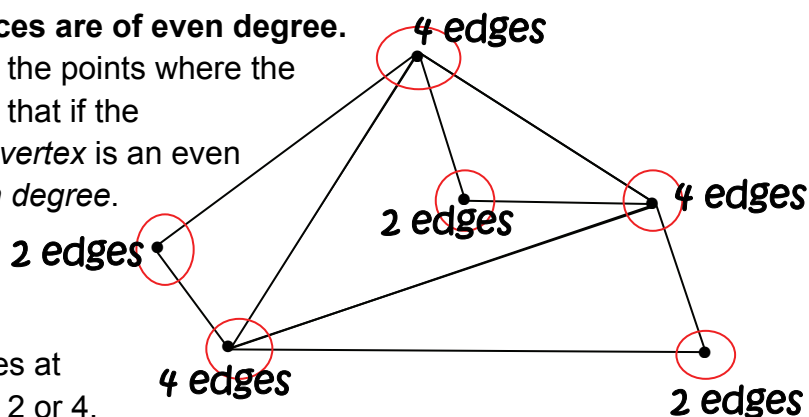
Which statement about the graph is true?

**A** All vertices are of even degree.

**B** No vertices are of even degree.

**C** Only one vertex is of even degree.

**D** Only three vertices are of even degree.

---

I need to look at the graph in this problem, and I need to read each answer choice in order to figure out which answer is true. I will think about each statement as I look at the graph.

**Answer choice A says: All vertices are of even degree.**
First, I remember that *vertices* are the points where the edges meet. *Even degree* means that if the number of edges that meet at the *vertex* is an even number, then the vertex is of *even degree*. I will count the number of edges that meet at each vertex.

*4 edges*

*4 edges*

*2 edges*

*2 edges*

*4 edges*

*2 edges*

When I look at the number of edges at each vertex, I see that they are all 2 or 4. Those are both even numbers, so answer choice **A** is true. But, just to be safe, I will check the other statements to make sure that they are not true.

**Answer choice B says: No vertices are of even degree.** Based on what I just figured out, this statement is not true. I found that there are vertices of even degree. Each vertex has 2 or 4 edges meeting at them, which are even numbers.

**Answer choice C says: Only one vertex is of even degree.** Based on what I just figured out, this statement is not true. I found that there is more than one vertex of even degree. Each vertex has 2 or 4 edges meeting at them, which are both even numbers.

**Answer choice D says: Only three vertices are of even degree.** Based on what I just figured out, this statement is not true. I found that all vertices are of even degree.
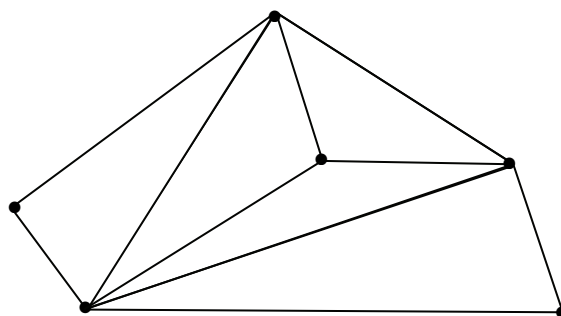
**8a**    Look at the vertex-edge graph.
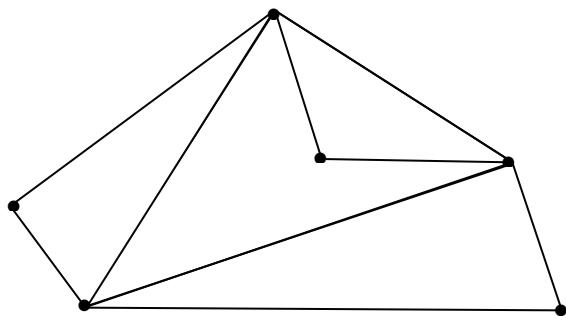
Which statement is **not** true?

A    The graph has an Euler circuit.

B    The graph has an Euler path.

C    The graph has 9 vertices.

D    The graph has 9 edges.

**8b**    Look at the vertex-edge graph.

Which statement about this graph is true?

A    The graph has an Euler path.

B    No vertices are of odd degree.

C    The graph has an Euler circuit.

D    Only one vertex is of odd degree.

**Summary Statement:**
These problems involve investigating the properties of vertex-edge graphs, including Euler paths, Euler circuits, and degrees of a vertex.

**10** Look at the graph.
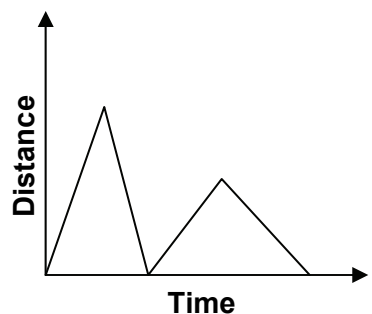


Which situation is **best** represented by the graph?

**A**   Nora runs to school. Along the way, she stops to pet a dog.

**B**   Nora walks to the store, buys some books, and then walks home again.

**C**   Nora reads a book, then does her homework, then watches TV, and then listens to music.

**D**   Nora throws a ball into the air and catches it. Then she throws it into the air again and catches it.

---

This first thing I think of when I look at this problem is to make sure I understand the graph.

The graph is showing the *distance* that something has moved over a certain amount of *time*. The time (on the *x*-axis) is always passing, or moving forward, but the distance (on the *y*-axis) is moving up and down.



So, now that I understand that the graph represents the distance something has moved over time, I think I will describe what I see in words.
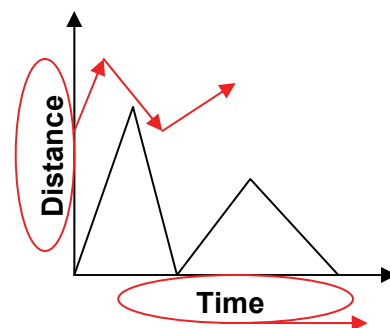


Something was still, then it moved a distance over time.

It moved the same distance back to where it started over time. Then it stopped.

It moved some distance again over time. It went the same distance back again to where it started. Then it stopped.

Now that I have my own description, I can use that to compare to the answer choices.

**Answer choice A says Nora runs to school. Along the way, she stops to pet a dog.** This does not match the graph. This statement has Nora running to school and only stopping once. My description has two stops.

**Answer choice B says Nora walks to the store, buys some books, and then walks home again.** This statement also does not match the graph. My description says that something has to go back to where it started two different times. This statement has only one time.

**Answer choice C says Nora reads a book, then does her homework, then watches TV, and then listens to music.** This statement does not match the graph, because there is no distance involved. Reading a book, doing homework, watching TV, and doing home only require time to pass, not distance. My description has a change in distance.

**Answer choice D says Nora throws a ball into the air and catches it. Then she throws it into the air again and catches it.** This statement sounds most like mine.

### My Statement

Nora throws a ball into the air and catches it. ⎰ Something was still, then it moved a distance over time. Then it moved the same distance back to where it started, and it stopped.

Then she throws it into the air again and catches it. ⎰ Then, it moved some distance over time. It went the same distance back again to where it started, and then it stopped.

The answer is choice **D**.

**10a**  Look at the graph.
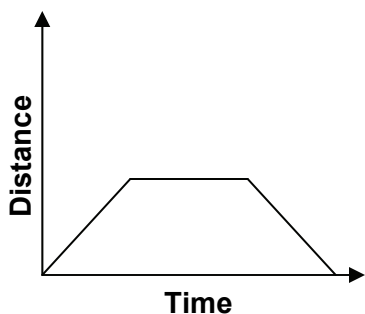


Which situation is **best** represented by the graph?

A    Jody runs quickly at the start of a race and then slows down after a while.

B    Jody walks to school, stays at school for the day, then walks back home.

C    Jody cleans her room, then she takes a nap, then she listens to music.

D    Jody walks to her friend's house, stays for awhile, goes home to get her books, then returns to her friend's house.

**10b**  Which graph could represent the situation below?

Ryan skateboards down a ramp, skateboards up the other side, and skateboards back down.
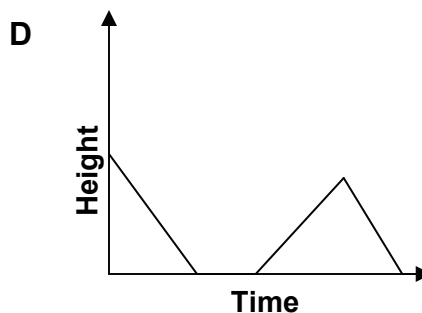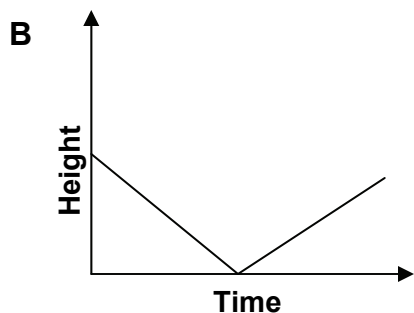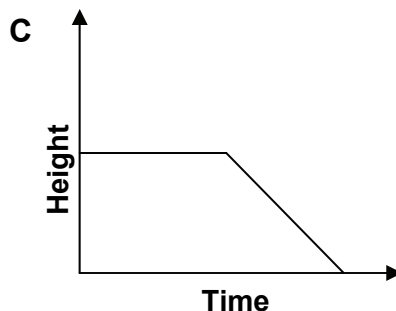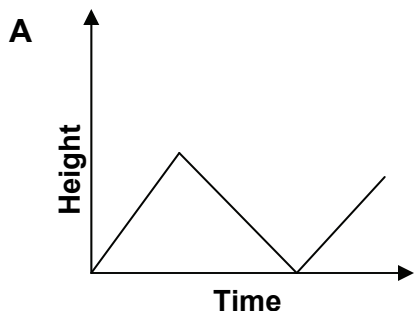


**Summary Statement:**
These problems involve describing patterns of change including constant rate and increasing or decreasing rate.

**12**    Scott ran in a two-day race. The first day he ran $5\frac{3}{4}$ miles. The next day he ran $6\frac{5}{8}$ miles. How many total miles did Scott run?

    **A**   $11\frac{3}{8}$

    **B**   $11\frac{2}{3}$

    **C**   $12\frac{3}{8}$

    **D**   $12\frac{3}{4}$

---

This question wants me to find out the total number of miles that Scott ran in his race. That sounds like all I need to do is add up the miles he ran from the first day plus the second day.

$$\underline{1^{st}\ day} \qquad\qquad \underline{next\ day}$$

$$5\frac{3}{4}\ miles \qquad\qquad 6\frac{5}{8}\ miles$$

I am adding fractions. When I add fractions, I remember that they need to have common *denominators*. These fractions do not have common *denominators*. I need to find the *least common denominator* for both fractions.

Looking at the denominators, I see that I have a 4 and an 8.

$$5\frac{3}{4}\ miles \qquad\qquad 6\frac{5}{8}\ miles$$

I will find the *least common multiple* for each of those numbers.

$$4 = 4, 8, 12, 16, 20, \ldots$$
$$8 = 8, 16, 24, 32, \ldots$$

When I do this, I see that 8 is the *least common multiple* for both numbers. That is now my *least common denominator*.

Now that I have my *least common denominator*, I need to convert my original fractions into that *common denominator*.

I will look at the denominator of my first fraction. It is 4. I need it to be 8. I think "what do I need to do for 4 to become 8?" I will multiply it by 2 because 4 x 2 = 8.

$$5\frac{3}{4} \xrightarrow{\ \times 2\ } 5\frac{\ \ }{8}$$

And, when I multiply the *denominator* by a number, I know that I must also multiply the *numerator* by the same number. I also leave the whole number as is, because I am only finding the least common denominator for both fractions.

$$5\frac{3}{4} \quad \begin{array}{c} \times 2 \\ \times 2 \end{array} = 5\frac{6}{8}$$

And, the second fraction that I have already has 8 for the denominator, so I do not have to do anything to that fraction.

$$6\frac{5}{8}$$

So, now I have a common denominator on both fractions and I can add them together.

$$5\frac{6}{8} \ + \ 6\frac{5}{8} \ = \ 11\frac{11}{8}$$

Now I have my answer, but it does not look like any of the ones in the answer choices.

When I look again at the fraction that I got for my answer, I see that the numerator is larger than the denominator. This means it is an *improper fraction* and I need to reduce it.

$$11\frac{11}{8}$$

I will keep the whole number as it is. Then, the fraction becomes $1\frac{3}{8}$. $\frac{11}{8}$ is the same as $\frac{8}{8} + \frac{3}{8}$. $\frac{8}{8} = 1$, and there is $\frac{3}{8}$ remaining.

$$11 \ + \ 1\frac{3}{8}$$

When I add these together, I get the final answer. The total number of miles that Scott ran in two days is $12\frac{3}{8}$, or answer choice **C**.

$$12\frac{3}{8}$$

**12a** Jan spent $3\frac{3}{4}$ hours doing homework last week. She spent $5\frac{1}{4}$ hours doing homework this week. How many more hours did Jan spend on homework this week than last week?

    **A**    $\frac{1}{4}$ hour

    **B**    $\frac{1}{2}$ hour

    **C**    $1\frac{1}{4}$ hours

    **D**    $1\frac{1}{2}$ hours

**12b** Matt and Ben are baking. Matt needs $5\frac{5}{6}$ cups of flour and Ben needs $3\frac{1}{3}$ cups of flour. How many cups of flour do Matt and Ben need together?

    **A**    $8\frac{6}{6}$ cups

    **B**    $8\frac{6}{9}$ cups

    **C**    $9\frac{1}{6}$ cups

    **D**    $9\frac{5}{6}$ cups

**Summary Statement:**
These problems involve adding and subtracting decimals through thousandths and fractions expressing solutions in simplest form.

**18**     A diagram of Ryan's yard is shown.
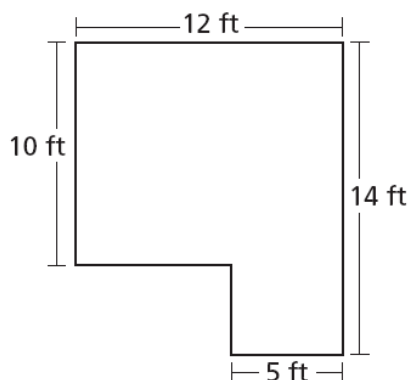


Which expression can Ryan use to find the total area of his yard?

**A**    (10 + 4) X (12 + 5)

**B**    (10 + 4) X (12 – 5)

**C**    (12 X 10) – (5 X 4)

**D**    (12 X 10) + (5 X 4)

---

This question is asking me to figure out which expression can find the answer. I do not actually have to find the total area.

I remember that total area is how many square units are inside of a shape. I also know that area is **length multiplied by width**. So, in order to find the area of this figure, I know I would have to find out the length times the width. Since this figure is kind of an odd shape, I will divide it into two separate rectangles.

I separated the figure into two rectangles:
The big one is 12 ft by 10 ft.
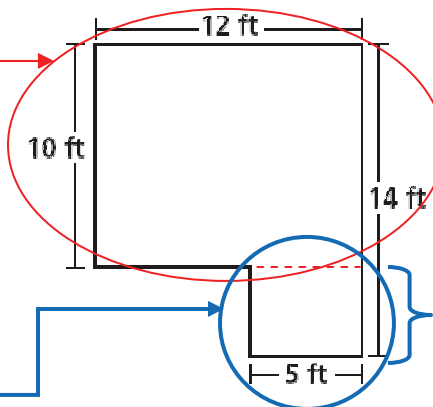


The second rectangle is smaller.
This one is 5 ft. by 4 ft.

I figured out the width is 4 ft because the width of the right side of the entire figure is 14 ft, and the width of the left side of the entire figure is 10 ft. The right side is then 14 ft – 10 ft which is 4 ft.

So, the area of each rectangle is length multiplied by width.

<u>larger rectangle</u>

$A = L \times W$

$L = 12$ ft, $W = 10$ ft

$A = 12$ ft $\times$ 10 ft
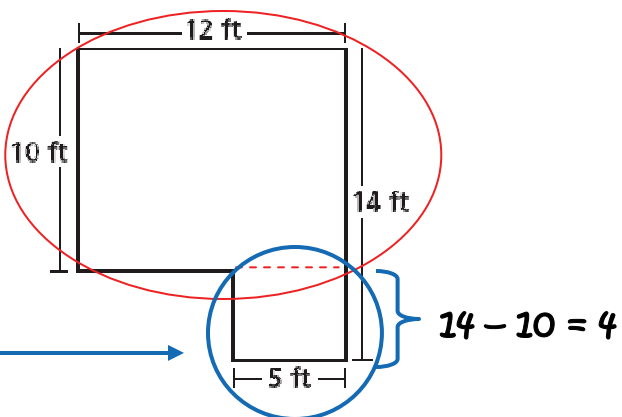


12 ft

10 ft

14 ft

5 ft

$14 - 10 = 4$

<u>smaller rectangle</u>

$A = L \times W$

$L = 5$ ft, $W = 4$ ft

$A = 5$ ft $\times$ 4 ft

I need the area of the entire figure, so I would add them together.

area of larger rectangle + area of smaller rectangle = total area of figure

(12 X 10)          +          (5 X 4)          = total area of figure

When I look at what I got (12 X 10) + (5 X 4), I see that it matches answer choice **D**.

**18a**  Look at the figure below.



6

3

2

10
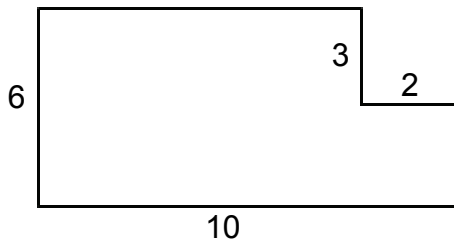
Which expression can be used to determine the area of the figure?

A   (8 x 6) + (2 x 3)

B   (8 x 10) + (2 x 3)

C   (10 x 6) + (2 x 3)

D   (10 x 2) + (2 x 3)

**18b**  The staff of Sunnydale Elementary is building a fence around the school playground.  The figure below shows the measurements of the land.



70 m   40 m   50 m   15 m   100 m
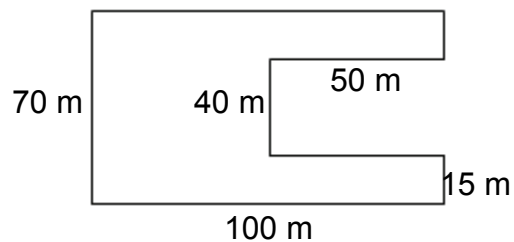
Which expression can the school staff use to find the perimeter of the playground for the fence?

A   2(70) + 2(100)

B   2(70) + 2(100) + 2(50)

C   70 + 100 + 40 + 15 + 50

D   70 + 2(100) + 2(50) + 2(15) + 40

**Summary Statement:**
These problems involve developing an algorithm or formula to calculate areas and perimeters of simple polygons.

**22**    What is the next term in the pattern?

1.25, 1.95, 2.65, 3.35, …

**A**   4.05

**B**   4.15

**C**   4.45

**D**   4.55

This question wants me to find the next number in the pattern. I remember that a pattern is a sequence of figures or numbers that are repeated in some kind of predictable way. I will look at the numbers in this pattern more closely to see if I can figure out how each term was created. Then, I can take the rule that I found to create the next term in the pattern.

I think, "What is the difference from the first term to the second term?"

+ .70

1.25 ,     1.95 ,     2.65 ,     3.35 , …

I see that .70 was added to the first term (1.25) in order to get the second tem (1.95). I will find out what the difference is between the second term and the third term.

It looks like to get the third term, .70 was added to the second term.

+ .70     + .70

1.25 ,     1.95 ,     2.65 ,     3.35 , …

Now, I will check if the difference between the third term (2.65) and the fourth term (3.35) is also .70. If it is, that means I can add .70 to each term in order to get the next.

It is true. In order to get the next term, I need to add .70 to the preceding term.

+ .70     + .70     + .70

1.25 ,     1.95 ,     2.65 ,     3.35 , …

I will add .70 to the fourth term in order to get the next term.

+ .70     + .70     + .70     + .70

1.25 ,     1.95 ,     2.65 ,     3.35 ,     4.05

After I added the .70 to the fourth term, I got 4.05, which is answer choice **A**. I could continue this pattern if I wanted to, just by adding .70 to each term that I find.

**22a** What is the next term in the pattern?

10.5, 9.25, 8.00, 6.75, …

**A** 5.00

**B** 5.25

**C** 5.50

**D** 5.75

**22b** What rule is used to create the pattern?

$1\frac{1}{4}$, $2\frac{1}{2}$, $3\frac{3}{4}$, 5, ...

**A** add 1

**B** add $1\frac{1}{4}$

**C** add $1\frac{1}{2}$

**D** add 2

**Summary Statement:**

These problems involve recognizing, describing, creating, and analyzing a numerical sequence which may include fractions and decimals using addition and subtraction.

**29**    Roberto began his homework at 4:25 p.m. He finished it one and a half hours later. At what time did Roberto finish his homework?

A    5:05 p.m.

B    5:55 p.m.

C    6:05 p.m.

D    6:15 p.m.

This problem is asking me to figure out at what time Roberto finished his homework.  In order to find that time, I will think about what I know.

- Roberto started his homework at 4:25 p.m.
- He finished 1 and a half hours later.

I will start at 4:25 and add 1 and a half hours.  Since there are 60 minutes in one hour, I know that there are 30 minutes in a half hour.  So, if it took Roberto 1 and a half hours to do his homework, I will add 1 hour and 30 minutes.

4:25 p.m.   = 4 hours  25 minutes
+ 1:30 hours = 1 hour    30 minutes
5: 55 p.m.  = 5 hours  55 minutes

After my addition, I get 5:55 p.m., which is answer choice **B**.

I need to remember that when adding time, it is different than adding decimals.  There are 60 minutes in one hour.  So when adding minutes that total over 60 minutes, I will exchange 60 minutes for one hour and add any remaining minutes.

**29a**  Debbie has piano lessons at 4:30 p.m. Her practice lasts 2 hours and 35 minutes. At what time will Debbie be finished with piano practice?

A  6:05 p.m.

B  6:35 p.m.

C  6:55 p.m.

D  7:05 p.m.

**29b**  John gets on his school bus at 7:05 a.m. The bus ride to school is 28 minutes. What time will John arrive at school?

A  7:23 a.m.

B  7:28 a.m.

C  7:33 a.m.

D  7:38 a.m.

**Summary Statement:**
These questions involve solving problems using elapsed time.