

GPS Grade 8 Sample Questions

The Georgia Department of Education has developed sample questions, in a multiple choice format, to illustrate the types of questions that might be seen on a standardized test such as the CRCT.

These are not intended to be a comprehensive means of assessment; instead teachers should use a variety of methods and strategies for assessing students. Tasks within the GPS frameworks along with additional resources including textbooks also offer a diverse assortment of assessments.

Unit 1: Outcomes and Likelihoods

KEY STANDARDS:

M8D2. Students will determine the number of outcomes related to a given event.

- Use tree diagrams to find the number of outcomes.
- Apply the addition and multiplication principles of counting.

M8D3. Students will use the basic laws of probability.

- Find the probability of simple independent events.
- Find the probability of compound independent events.

1. (M8D2a)

The Brown County School System is opening an all girls academy next school year. The girls will have the opportunity to wear various clothing items as part of their uniform.

Tops	Pants	Shoes
Green shirt	Khaki slacks	Dress shoes
Yellow shirt	Blue jeans	
	Khaki skort	White tennis shoes

If the girls choose 1 top, 1 pant, and 1 pair of shoes, how many different ways can they wear their uniform?

- 6
- 12
- 30
- 8

Answer: B

Continued...

GPS Grade 8 Sample Questions

Unit 1: Outcomes and Likelihoods

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- a. Use tree diagrams to find the number of outcomes.
- b. Apply the addition and multiplication principles of counting.

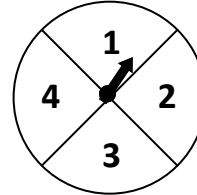
M8D3. Students will use the basic laws of probability.

- a. Find the probability of simple independent events.
- b. Find the probability of compound independent events.

Continued...

2. (M8D3a)

Use the spinner below to answer the question.



Maria was asked to find the probability of the spinner landing on an odd number.

Darryl was asked to add two more sections to the spinner so that all six sections were the same size. Four of the sections were labeled using the same numbers shown in the spinner above, the two new sections were both labeled with a “5”. He was asked to find the probability of the new spinner landing on an odd number.

Which of the following is a true statement about the relationship between Maria’s spinner and Darryl’s spinner?

- A. The number of possible outcomes on Maria’s spinner is equal to the number of possible outcomes on Darryl’s spinner.
- B. The probability of landing on an odd number using Maria’s spinner is greater than the probability of landing on an odd number using Darryl’s spinner.
- C. The probability of landing on an odd number using Maria’s spinner is less than the probability of landing on an odd number using Darryl’s spinner. *
- D. The number of possible outcomes on Darryl’s spinner is six.

Answer: C

Continued...

GPS Grade 8 Sample Questions

Unit 1: Outcomes and Likelihoods

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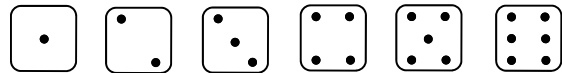
M8D3. Students will use the basic laws of probability.

- Find the probability of simple independent events.
- Find the probability of compound independent events.

Continued...

3. (M8D3b)

Justin needs an even number on his next two rolls using the number cube whose sides are shown below to win the game he is playing. What is the probability that Justin will be a winner after his next two rolls?



- $\frac{1}{4}$
- $\frac{1}{6}$
- $\frac{1}{2}$
- $\frac{1}{9}$

Answer: A

GPS Grade 8 Sample Questions

Unit 2: The Powers That Be

KEY STANDARDS:

M8N1. Students will understand different representations of numbers including square roots, exponents, and scientific notation.

- Find square roots of perfect squares.
- Recognize the (positive) square root of a number as a length of a side of a square with a given area.
- Recognize square roots as points and as lengths on a number line.
- Understand that the square root of 0 is 0 and that every positive number has two square roots that are opposite in sign.
- Recognize and use the radical symbol to denote the positive square root of a positive number.
- Estimate square roots of positive numbers.
- Simplify, add, subtract, multiply, and divide expressions containing square roots.
- Distinguish between rational and irrational numbers.
- Simplify expressions containing integer exponents.
- Express and use numbers in scientific notation.
- Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.

M8G2. Students will understand and use the Pythagorean theorem.

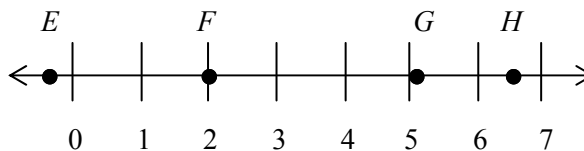
- Apply properties of right triangles, including the Pythagorean theorem.
- Recognize and interpret the Pythagorean theorem as a statement about areas of squares on the sides of a right triangle.

1. (M8N1c)

Use the picture of the ice cream cone to answer the question below.



Which letter best represents the location of the length of the slant height of the ice cream cone on the number line shown below?



- A. *F*
B. *E*
C. *H*
D. *G*

Answer: D

Continued...

GPS Grade 8 Sample Questions

Unit 2: The Powers That Be

KEY STANDARDS:

M8N1. Students will understand different representations of numbers including square roots, exponents, and scientific notation.

- Find square roots of perfect squares.
- Recognize the (positive) square root of a number as a length of a side of a square with a given area.
- Recognize square roots as points and as lengths on a number line.
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- Simplify expressions containing integer exponents.
- Express and use numbers in scientific notation.
- Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.

M8G2. Students will understand and use the Pythagorean theorem.

- Apply properties of right triangles, including the Pythagorean theorem.
- Recognize and interpret the Pythagorean theorem as a statement about areas of squares on the sides of a right triangle.

Continued...

2. (M8N1i)

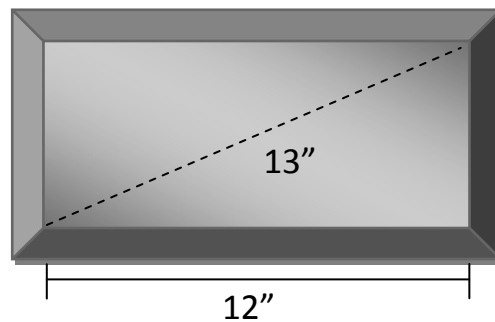
Substitute the \square with the integer that will make the statement below a true statement.

$$p^{\square} p^2 = p^8$$

- 4
- 10
- 6
- 8

3. (M8G2a)

The diagram below shows the width of a television and the length of its diagonal. A replacement of the front panel of glass needs to be ordered and is priced by the square inch. Determine the area of the screen.



- 156 in²
- 200 in²
- 78 in²
- 60 in²

2. Answer: C

3. Answer: D

GPS Grade 8 Sample Questions

Unit 3: Equal or Not

KEY STANDARDS:

M8A1. Students will use algebra to represent, analyze, and solve problems.

- Represent a given situation using algebraic expressions or equations in one variable.
- Simplify and evaluate algebraic expressions.
- Solve algebraic equations or inequalities in one variable, including those involving absolute values.
- Solve equations involving several variables for one variable in terms of the others.
- Interpret solutions in problem contexts.

M8A2. Students will understand and graph inequalities in one variable.

- Represent a given situation using an inequality in one variable.
- Use the properties of inequality to solve inequalities.
- Graph the solution of an inequality on a number line.
- Interpret solutions in problem contexts.

1. (M8A1c)

A repairman estimated the cost of replacing a part in Mrs. James' computer would be at most \$225. The estimate included \$35 for the part, a \$40 service charge, and \$30 per hour for labor. What is the maximum number of hours the repairman estimated for the job?

- $4\frac{1}{2}$
- 5
- $5\frac{1}{2}$
- 6

2. (M8A1d)

The volume of a cone is $V = \frac{1}{3}\pi r^2 h$. A farmer needs to determine the height of his silo. Solve the volume of a cone for h .

- $h = V - \frac{1}{3}\pi r^2$
- $h = \frac{1}{3}\pi r^2 V$
- $h = 3V$
- $h = \frac{3V}{\pi r^2}$

1. Answer: B

2. Answer: D

Continued...

GPS Grade 8 Sample Questions

Unit 3: Equal or Not

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- Solve algebraic equations or inequalities in one variable, including those involving absolute values.
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- Represent a given situation using an inequality in one variable.
- Use the properties of inequality to solve inequalities.
- Graph the solution of an inequality on a number line.
- Interpret solutions in problem contexts.

Continued...

3. (M8A2c)

A salesman used the inequality $4(2 - x) \geq 20$ in analyzing his inventory. Choose the best description of the graph that represents the solution to $4(2 - x) \geq 20$.

- All values to the right of -3 on the number line satisfy $4(2 - x) \geq 20$.
- All values to the right of -3(including -3) on the number line satisfy $4(2 - x) \geq 20$.
- All values to the left of -3 on the number line satisfy $4(2 - x) \geq 20$.
- All values to the left of -3(including -3) on the number line satisfy $4(2 - x) \geq 20$.

Answer: D

GPS Grade 8 Sample Questions

Unit 4: Functional Relationships

KEY STANDARDS:

M8A3. Students will understand relations and linear functions.

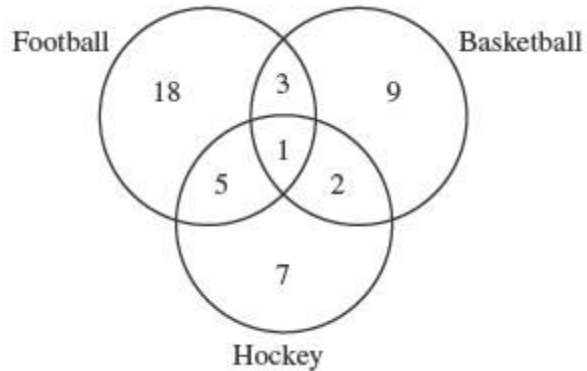
- Recognize a relation as a correspondence between varying quantities.
- Recognize a function as a correspondence between inputs and outputs where the output for each input must be unique.
- Distinguish between relations that are functions and those that are not functions.
- Recognize functions in a variety of representations and a variety of contexts.
- Use tables to describe sequences recursively and with a formula in closed form.
- Understand and recognize arithmetic sequences as linear functions with whole number input values.
- Interpret the constant difference in an arithmetic sequence as the slope of the associated linear function.
- Identify relations and functions as linear or nonlinear.
- Translate among verbal, tabular, graphic, and algebraic representations of functions.

M8D1. Students will apply basic concepts of set theory.

- Demonstrate relationships among sets through use of Venn diagrams.
- Determine subsets, complements, intersection, and union of sets.
- Use set notation to denote elements of a set.

1. (M8D1a)

Coach Wilson constructed a Venn diagram that shows the number of eighth-grade athletes who play football, basketball, and hockey.



How many more athletes play football than basketball?

- 3
- 4
- 9
- 12

Answer: D

Continued...

GPS Grade 8 Sample Questions

Unit 4: Functional Relationships

KEY STANDARDS:

M8A3. Students will understand relations and linear functions.

- a. Recognize a relation as a correspondence between varying quantities.
- b. Recognize a function as a correspondence between inputs and outputs where the output for each input must be unique.
- c. Distinguish between relations that are functions and those that are not functions.
- d. Recognize functions in a variety of representations and a variety of contexts.
- e. Use tables to describe sequences recursively and with a formula in closed form.
- f. Understand and recognize arithmetic sequences as linear functions with whole number input values.
- g. Interpret the constant difference in an arithmetic sequence as the slope of the associated linear function.
- h. Identify relations and functions as linear or nonlinear.
- i. Translate among verbal, tabular, graphic, and algebraic representations of functions.

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Continued...

2. (M8A3c)

Which of the following relationships in the form (input, output) does NOT represent a function?

- A. (state, capital)
- B. (person, birth date)
- C. (social security number, person)
- D. (date, temperature)

Answer: D

Continued...

GPS Grade 8 Sample Questions

Unit 4: Functional Relationships

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Continued...

3. (M8A3e)

Michael noticed a pattern on his cell phone bill when he read his text messaging charges.

Cost
\$2.00
\$2.10
\$2.20
\$2.30

Which recursive definition describes Michael's text messaging charges?

A.
$$\begin{cases} t_1 = 2.10 \\ t_n = t_{n-1} - 0.10 \end{cases}$$

B.
$$\begin{cases} t_1 = 2.00 \\ t_n = t_{n-1} + 0.10 \end{cases}$$

C.
$$\begin{cases} t_1 = 2.10 \\ t_n = t_{n-1} - 2.00 \end{cases}$$

D.
$$\begin{cases} t_1 = 2.00 \\ t_n = t_{n-1} + 2.10 \end{cases}$$

Answer: B

GPS Grade 8 Sample Questions

Unit 5: Slippery Slope

KEY STANDARDS:

M8A3. Students will understand relations and linear functions.

- d. Recognize functions in a variety of representations and a variety of contexts.
- h. Identify relations and functions as linear or nonlinear.
- i. Translate among verbal, tabular, graphic, and algebraic representations of functions.

M8A4. Students will graph and analyze graphs of linear equations and inequalities.

- a. Interpret slope as a rate of change.
- b. Determine the meaning of the slope and y-intercept in a given situation.
- c. Graph equations of the form $y = mx + b$.
- d. Graph equations of the form $ax + by = c$.
- e. Graph the solution set of a linear inequality, identifying whether the solution set is an open or a closed half-plane.
- f. Determine the equation of a line given a graph, numerical information that defines the line or a context involving a linear relationship.
- g. Solve problems involving linear relationships.

M8D4. Students will organize, interpret, and make inferences from statistical data.

- a. Gather data that can be modeled with a linear function.
- b. Estimate and determine a line of best fit from a scatter plot.

1. (M8A4a)

Music Record Company produces 120 CDs every 10 minutes.

What would the slope of the line in a graph of this situation represent?

- A. 120 CDs per minute
- B. 10 CDs per hour
- C. 12 CDs per minute
- D. 12 CDs every 10 minutes

2. (M8A4e)

Choose the statement that describes the solution to this inequality?

$$y > \frac{2}{3}x + 1$$

- A. dashed line; half-plane above dashed line
- B. solid line; half-plane above solid line
- C. dashed line; half-plane below dashed line
- D. solid line; half-plane below solid line

1. Answer: C

2. Answer: A

Continued...

GPS Grade 8 Sample Questions

Unit 5: Slippery Slope

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M8A3. Students will understand relations and linear functions.

- d. Recognize functions in a variety of representations and a variety of contexts.
- h. Identify relations and functions as linear or nonlinear.
- i. Translate among verbal, tabular, graphic, and algebraic representations of functions.

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- d. Graph equations of the form $ax + by = c$.
- e. Graph the solution set of a linear inequality, identifying whether the solution set is an open or a closed half-plane.
- f. Determine the equation of a line given a graph, numerical information that defines the line or a context involving a linear relationship.
- g. Solve problems involving linear relationships.

M8D4. Students will organize, interpret, and make inferences from statistical data.

- a. Gather data that can be modeled with a linear function.
- b. Estimate and determine a line of best fit from a scatter plot.

Continued...

3. (M8A3i)

The table gives the population, p , in a region of the country as a function of the years since 2003, t .

t	1	2	3	4
p	42,500	43,000	43,500	44,000

Which equation represents this data algebraically?

- A. $p = 42,500 + 1,000t$
- B. $p = 42,000 + 500t$
- C. $p = 42,500 + 500t$
- D. $p = 40,000 + 1,500t$

Answer: B

Continued...

GPS Grade 8 Sample Questions

Unit 5: Slippery Slope

KEY STANDARDS:

M8A3. Students will understand relations and linear functions.

- d. Recognize functions in a variety of representations and a variety of contexts.
- h. Identify relations and functions as linear or nonlinear.
- i. Translate among verbal, tabular, graphic, and algebraic representations of functions.

M8A4. Students will graph and analyze graphs of linear equations and inequalities.

- h. Interpret slope as a rate of change.
- i. Determine the meaning of the slope and y-intercept in a given situation.
- j. Graph equations of the form $y = mx + b$.
- k. Graph equations of the form $ax + by = c$.
- l. Graph the solution set of a linear inequality, identifying whether the solution set is an open or a closed half-plane.
- m. Determine the equation of a line given a graph, numerical information that defines the line or a context involving a linear relationship.
- n. Solve problems involving linear relationships.

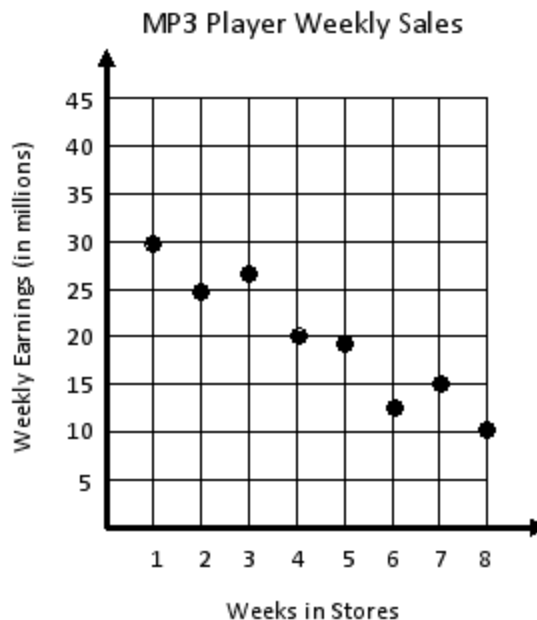
M8D4. Students will organize, interpret, and make inferences from statistical data.

- c. Gather data that can be modeled with a linear function.
- d. Estimate and determine a line of best fit from a scatter plot.

Continued...

4. (M8D4d)

This scatter plot shows a relationship between the number of weeks in stores and weekly earnings for an MP3 player.



Which equation would represent the line of best fit for this data?

A. $y = \frac{20}{-7}x + 32\frac{6}{7}$

B. $y = 8x + 30$

C. $y = -x + 35$

D. $y = \frac{15}{4}x + 38$

Answer: A

GPS Grade 8 Sample Questions

Unit 6: Traversing Congruency

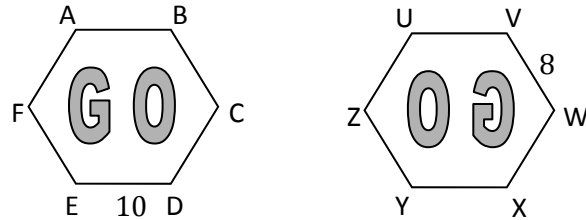
KEY STANDARDS:

M8G1. Students will understand and apply the properties of parallel and perpendicular lines and understand the meaning of congruence.

- Investigate characteristics of parallel and perpendicular lines both algebraically and geometrically.
- Apply properties of angle pairs formed by parallel lines cut by a transversal.
- Understand the properties of the ratio of segments of parallel lines cut by one or more transversals.
- Understand the meaning of congruence: that all corresponding angles are congruent and all corresponding sides are congruent.

1. (M8G1d)

Hexagon ABCDEF is congruent to hexagon UVWXYZ.



$\angle B$ is 120°
 $\angle U$ is x°
 $\angle W$ is $x^\circ - 25^\circ$

What is the value of $\angle F$?

- 120°
- 95°
- 240°
- 8°

Answer: B

Continued...

GPS Grade 8 Sample Questions

Unit 6: Traversing Congruency

KEY STANDARDS:

M8G1. Students will understand and apply the properties of parallel and perpendicular lines and understand the meaning of congruence.

- a. Investigate characteristics of parallel and perpendicular lines both algebraically and geometrically.
- b. Apply properties of angle pairs formed by parallel lines cut by a transversal.
- c. Understand the properties of the ratio of segments of parallel lines cut by one or more transversals.
- d. Understand the meaning of congruence: that all corresponding angles are congruent and all corresponding sides are congruent.

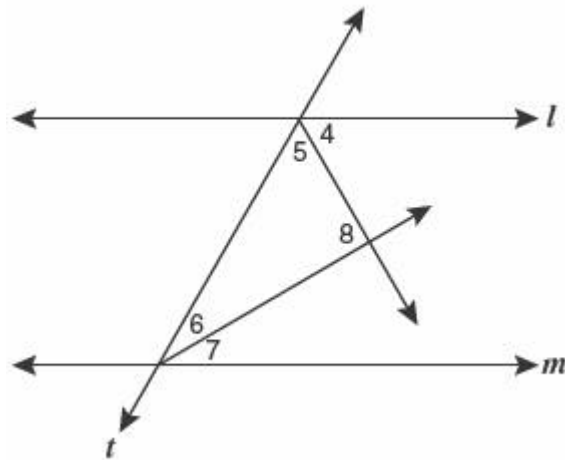
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2. (M8G1b)

Parallel lines l and m are cut by transversal t .

$$m\angle 4 = m\angle 5$$

$$m\angle 6 = m\angle 7$$



What is the measure of $\angle 8$?

- A. 120°
- B. 90°
- C. 65°
- D. 45°

Answer: B

GPS Grade 8 Sample Questions

Unit 7: Systems

KEY STANDARDS:

M8A5. Students will understand systems of linear equations and inequalities and use them to solve problems.

- Given a problem context, write an appropriate system of linear equations or inequalities.
- Solve systems of equations graphically and algebraically, using technology as appropriate.
- Graph the solution set of a system of linear inequalities in two variables.
- Interpret solutions in problem contexts.

1. (M8A5a)

The Bulldog Theater charges \$9.10 for adult tickets and \$7.75 for student tickets. Mrs. Williams purchased 7 tickets (some students and some adult) for \$56.95. Which system of equations could be used to find a , the number of adult tickets, and s , the number of students tickets Mrs. Williams purchased?

- A. $\begin{cases} a + s = 56.95 \\ 7.75a + 9.10s = 7 \end{cases}$
- B. $\begin{cases} a + s = 7 \\ 9.10a + 7.75s = 56.95 \end{cases}$
- C. $\begin{cases} 9.10a + 7.75s = 56.95 \\ a + s = 56.95 \end{cases}$
- D. $\begin{cases} 7.75a + 9.10s = 56.95 \\ a + s = 7 \end{cases}$

2. (M8A5b)

The following system of equations represents the profit margin of two major companies when x represents sales and y represents discounts to clients.

$$\begin{cases} 3x - 4y = 12 \\ x - 2y = 2 \end{cases}$$

Which of the following is the best approach to solving this system of equations?

- Multiply the expression $x - 2y$ by 3 and add the first equation to the second equation
- Substitute the expression $2 + 2y$ for x in the first equation of the system.
- Add the first equation to the second equation
- Substitute the expression $x - 2y$ for x in the first equation of the system

1. Answer: B

2. Answer: B