



DEPARTMENT OF EDUCATION

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Working Together for Student Success

ISTEP+: Grade 7

Mathematics

Companion to Released Part 1 Applied Skills
(Open-Ended) Items and Scoring Notes: Online Examples

Introduction

When the *ISTEP+* Spring 2016 test was administered to Indiana students in Grades 3-8 and 10, the Math Part 1 Applied Skills tests were only offered in a Paper/Pencil format. Beginning in Spring 2017, Math Part 1 Applied Skills assessments will be available through the online testing platform. In order to help teachers, students, and parents better understand how students can use the online testing platform to show their work in math, the Indiana Department of Education has created this document (as a companion to the Released Items and Scoring Notes document), which consists of sample student responses to the 2016 Math Part 1 Applied Skills items in an online format.

The Show All Work box gives students a place to show their thought processes. Scorers do not expect students to show computational work (such as regrouping or the long division process) in the online platform, but rather to simply list or describe the steps that they took in to solve the problem. For example, if a student uses an equation to find an answer, he can simply type in that equation. If the student were to draw a picture to solve the problem, he could describe what he drew using words in the box.

This document should be used in correlation with the Released Items and Scoring Notes document, which also contains descriptions of types of questions, a summary of scoring rules, a copy of math rubrics, and student anchor papers (sample student responses) in Paper/Pencil format.

Item #1
Constructed-Response Online
Recyclable Paper

Question 1, Sample A – Algebra & Functions Score Point 2; Process Score Point 2

An office pays a company to collect recyclable paper each week. The recycling company charges a \$20.00 collection fee and \$0.30 for each kilogram of paper it collects.

Last week, the office had to pay the recycling company \$59.60.

Part A

Write an equation that can be used to determine the number of kilograms of paper the recycling company collected from the office last week. Be sure to define the variable in your equation.

Define the variable:

Equation:

Part B

This week, the office projects that they will have 20% more recyclable paper than last week.

Based on this projection, how many kilograms of recyclable paper will the office have this week?

Show All Work



$59.60 - 20.00 = 39.6$
 $39.6 \div .30 = 132$
 $132 \times .20 = 26.4$
 $132.0 + 26.4 = 158.4$

▼ Math symbols

+	-	×	÷
±	-	·	/
=	≠	$\frac{\square}{\square}$	$\frac{\square}{\square}$
y^x	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	π
(-)	°	·	

► Relations

► Geometry

Answer kilograms

Scoring Notes: The response demonstrates a thorough understanding of algebra and functions with both a good variable definition and a valid equation in Part A. The response also determines a thorough understanding of the mathematical process with a valid setup and a correct solution for the number of kilograms of recyclable paper in Part B. This response receives two points for content and two points for process.

Question 1, Sample B – Algebra & Functions Score Point 2; Process Score Point 1

An office pays a company to collect recyclable paper each week. The recycling company charges a \$20.00 collection fee and \$0.30 for each kilogram of paper it collects.

Last week, the office had to pay the recycling company \$59.60.

Part A

Write an equation that can be used to determine the number of kilograms of paper the recycling company collected from the office last week. Be sure to define the variable in your equation.

Define the variable:

Equation:

Part B

This week, the office projects that they will have 20% more recyclable paper than last week.

Based on this projection, how many kilograms of recyclable paper will the office have this week?

Show All Work



$59.60 - 20 = 39.6 \div .30 = 132$ kilograms of paper

$132 \times .20 = 26.4$

Math symbols

+	-	×	÷
±	-	·	/
=	≠	≡	≡
y^x	√	∛	π
(·)	°	·	

Relations

Geometry

Answer kilograms

Scoring Notes: The response demonstrates a thorough understanding of algebra and functions with both a good variable definition and a valid equation in Part A. The response demonstrates a limited understanding of the mathematical process in Part B as only the increase in the kilograms of recyclable paper is found. This increase is not added to the original amount of recyclable paper which is correctly determined in the first portion of Part B. This response receives two points for content and one point for process.

Question 1, Sample C – Algebra & Functions Score Point 1; Process Score Point 1

An office pays a company to collect recyclable paper each week. The recycling company charges a \$20.00 collection fee and \$0.30 for each kilogram of paper it collects.

Last week, the office had to pay the recycling company \$59.60.

Part A

Write an equation that can be used to determine the number of kilograms of paper the recycling company collected from the office last week. Be sure to define the variable in your equation.

Define the variable: X represents how many number of kilograms of paper collected

Equation: $(59.60 - 20.00) \div 0.03 = x$

Part B

This week, the office projects that they will have 20% more recyclable paper than last week.

Based on this projection, how many kilograms of recyclable paper will the office have this week?

Show All Work



$$\begin{aligned} 59.60 \times .2 &= 119.20 \\ 119.20 - 20.00 &= 99.20 \\ 99.2000 \div 30 &= 33.06 \end{aligned}$$

Math symbols

+	-	×	÷
±	-	·	/
=	≠	$\frac{\square}{\square}$	$\frac{\square}{\square}$
y^x	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	π
(-)	°	·	

Relations

Geometry

Answer 33.06 kilograms

Scoring Notes: The response demonstrates a partial understanding of algebra and functions by providing a correct equation in Part A but does not solve for the correct number of kilograms of recyclable paper prior to the increase in Part B. The response also demonstrates a partial understanding of the mathematical process as the variable definition is valid in Part A, but the correct number of kilograms of recyclable paper after the increase is not determined. This response receives one point for content and one point for process.

Question 1, Sample D – Algebra & Functions Score Point 1; Process Score Point 0

An office pays a company to collect recyclable paper each week. The recycling company charges a \$20.00 collection fee and \$0.30 for each kilogram of paper it collects.

Last week, the office had to pay the recycling company \$59.60.

Part A

Write an equation that can be used to determine the number of kilograms of paper the recycling company collected from the office last week. Be sure to define the variable in your equation.

Define the variable: $\$59.60 - \$20.00 = x \div \$0.30 = K$

Equation: $\$59.60 - \$20.00 = \$39.60 \div \$0.30 = 132 \text{ Kilograms}$

Part B

This week, the office projects that they will have 20% more recyclable paper than last week.

Based on this projection, how many kilograms of recyclable paper will the office have this week?

Show All Work



$$132 \times .20 = 26.40$$

▼ Math symbols

+	-	×	÷
±	-	·	/
=	≠	≡	≡
y^x	√	∛	π
(·)	°	·	

► Relations

► Geometry

Answer kilograms

Scoring Notes: The response demonstrates a partial understanding of algebra and function by providing an incorrect equation in Part A, but a correct solution for the amount of recyclable paper prior to the increase in the equation portion of Part A. The response demonstrates little to no understanding of the mathematical process as the variable definition is invalid in Part A. The response demonstrates a limited understanding of the mathematical process in Part B as only the increase in the kilograms of recyclable paper, which is correctly determined in the first portion of Part B. This response receives one point for content and zero points for process.

Item #2
Constructed-Response Online
Foam Pillow

Note: This item is not available for online samples.

Item #3
Constructed-Response Online
Comparing Purchase Prices

Question 3, Sample A – Computation Score Point 2; Process Score Point 2

Martha is buying two shirts that cost \$18.00 and \$33.00 at a local store. She is considering two options to purchase the shirts.

Option A: Use the store sale—buy one shirt and get a second shirt of equal or lesser value free.

Option B: Use a coupon for 40% off the purchase, before tax. The coupon cannot be used with the store sale.

Martha will also pay 7% tax on her purchase.

Which option will cost less money? Be sure to include the total price, including tax, of each option in your answer. Use words, numbers, and/or symbols to justify your answer.

Show All Work



$$\text{Option A: } 33.00 + 2.31 (\text{tax}) = 35.31$$

$$\text{Option B: } 33 + 18 = 51$$

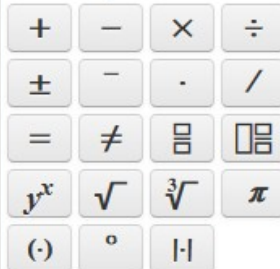
$$51 \times .40 = 20.40$$

$$51.00 - 20.40 = 30.68$$

$$30.68 + 2.14 = 32.82$$

Option B would be less because the coupon takes 20 dollars off of the 51.

Math symbols



Relations

Geometry

Scoring Notes: The response indicates a thorough understanding of discounts and tax in computation given the correct calculations for options A and B. The response demonstrates a thorough understanding of the mathematical process by correctly stating option B costs less than option A. This response receives two points for content and two points for process.

Question 3, Sample B – Computation Score Point 1; Process Score Point 2

Martha is buying two shirts that cost \$18.00 and \$33.00 at a local store. She is considering two options to purchase the shirts.

Option A: Use the store sale—buy one shirt and get a second shirt of equal or lesser value free.

Option B: Use a coupon for 40% off the purchase, before tax. The coupon cannot be used with the store sale.

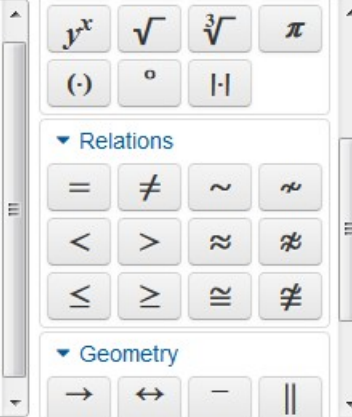
Martha will also pay 7% tax on her purchase.

Which option will cost less money? Be sure to include the total price, including tax, of each option in your answer. Use words, numbers, and/or symbols to justify your answer.

Show All Work



A: $\$33 + \$18 - \$18 = \33
 $\$33 \times .7 = 23.1$
 $33 - 23.1 = 9.9$ (*sale tax*)
 $\$33 + \$9.90 = \$42.90$
B: $18 + 33 = 51$
 $51 \times 40\text{percent} = 51 \times .4 = \20.40
 $\$20.40 \times .7 = \$14.28 + \$20.40 = \34.68
Option B will cost less money because A is \$42.90 and B is \$34.68. So, $\$42.90 > \34.68 .



Scoring Notes: The response indicates a thorough understanding of discounts and tax in computation given the correct calculations for options A and B. The response demonstrates a thorough understanding of the mathematical process by correctly stating option B costs less than option A. This response receives two points for content and two points for process.

Item #4

Extended-Response Online

Renting a Truck

Note: This item is not available for online samples.