Kentucky Summative Assessments


# Grade 8 Mathematics
# Released Items
## 2024

**1**

MA0820109_2

Consider the equation.

$$\frac{2}{3}(3x - 15) + 4 = ax + 5 + k$$

For $x$ to have infinitely many solutions, what should be the values of $a$ and $k$?

**A** $a = 2; k = ^{-}16$

**B** $a = 2; k = ^{-}11$

**C** $a = 3; k = ^{-}20$

**D** $a = 3; k = ^{-}1$

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820109*
**Book Question Number:** 1

**Standard:** KY.8.EE.7.a

**Item Type:** MC
**Key:** B

| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Answer Choice Options | | | |
|---|---|---|---|---|---|---|---|
| | | | | A (%) | B (%) | C (%) | D (%) |
| *All Students* | **22,089** | 41% | 0.41 | 19% | 41% | 27% | 13% |
| *Gender* | | | | | | | |
| Female | **10,441** | 41% | 0.41 | 18% | 41% | 28% | 13% |
| Male | **11,648** | 41% | 0.41 | 19% | 41% | 27% | 13% |
| *Ethnicity* | | | | | | | |
| African American | **2,516** | 35% | 0.35 | 20% | 35% | 31% | 14% |
| American Indian or Alaska Native | **28** | 43% | 0.43 | 29% | 43% | 11% | 18% |
| Asian | **416** | 53% | 0.53 | 17% | 53% | 19% | 11% |
| Hispanic or Latino | **2,237** | 41% | 0.41 | 19% | 41% | 26% | 14% |
| Native Hawaiian or Pacific Islander | **45** | 51% | 0.51 | 4% | 51% | 22% | 22% |
| White (non-Hispanic) | **15,741** | 42% | 0.42 | 18% | 42% | 27% | 13% |
| Two or more races | **1,105** | 38% | 0.38 | 20% | 38% | 28% | 14% |
| | | | | | | | |
| Migrant | **133** | 41% | 0.41 | 18% | 41% | 32% | 10% |
| | | | | | | | |
| English Learner | **1,469** | 38% | 0.38 | 19% | 38% | 29% | 14% |
| | | | | | | | |
| Economically Disadvantaged | **13,717** | 38% | 0.38 | 19% | 38% | 29% | 14% |
| | | | | | | | |
| Students with Disabilities | **3,979** | 33% | 0.33 | 20% | 33% | 32% | 14% |

* Calculator section

**2** MA0820021

Eric has 15 coins. All the coins are nickels and dimes. The total value of the coins is \$0.85.

- Complete the two equations that can be used to determine the number of nickels, $n$, and the number of dimes, $d$, that Eric has.
- How many dimes does Eric have?

Enter your answers in the space provided. Enter **only** your answers.

Equations: $\begin{cases} n + d = \square \\ 0.05n + 0.10d = \square \end{cases}$

Number of dimes: $\square$

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820021*
**Book Question Number:** 2

**Standard:** KY.8.EE.8.c

**Item Type:** SA
**Key:** Rubric

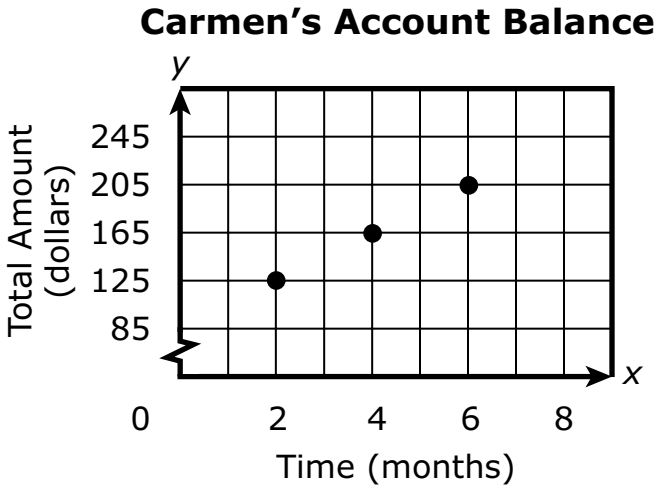
| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Score Percentages | | |
|---|---|---|---|---|---|---|
| | | | | Score 0 (%) | Score 1 (%) | Score 2 (%) |
| *All Students* | **24,752** | 22.5% | 0.45 | 67% | 21% | 12% |
| *Gender* | | | | | | |
| Female | **12,067** | 21.2% | 0.42 | 69% | 20% | 11% |
| Male | **12,685** | 23.8% | 0.48 | 65% | 22% | 13% |
| *Ethnicity* | | | | | | |
| African American | **2,527** | 11.6% | 0.23 | 81% | 15% | 4% |
| American Indian or Alaska Native | **38** | 27.6% | 0.55 | 61% | 24% | 16% |
| Asian | **507** | 48.1% | 0.96 | 41% | 21% | 37% |
| Hispanic or Latino | **2,174** | 17.2% | 0.34 | 73% | 19% | 8% |
| Native Hawaiian or Pacific Islander | **46** | 16.3% | 0.33 | 74% | 20% | 7% |
| White (non-Hispanic) | **18,181** | 24.2% | 0.48 | 65% | 22% | 13% |
| Two or more races | **1,279** | 19.8% | 0.40 | 71% | 19% | 10% |
| | | | | | | |
| Migrant | **109** | 13.8% | 0.28 | 80% | 13% | 7% |
| | | | | | | |
| English Learner | **885** | 8.1% | 0.16 | 85% | 13% | 2% |
| | | | | | | |
| Economically Disadvantaged | **14,562** | 16.9% | 0.34 | 74% | 19% | 7% |
| | | | | | | |
| Students with Disabilities | **1,765** | 13.1% | 0.26 | 79% | 15% | 6% |

* Calculator section

**3**

MA0820041_2

Carmen saves the same amount of money each week from her paycheck. She deposits the money in a bank account and does not withdraw any money from the account. The points graphed on the coordinate plane shown represent this relationship.




Which equation can be used to represent this relationship?

**A** $y = 85x + 20$

**B** $y = 20x + 85$

**C** $y = 62.5x + 40$

**D** $y = 40x + 62.5$

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820041*
**Book Question Number:** 3

**Standard:** KY.8.F.4.a

**Item Type:** MC
**Key:** B

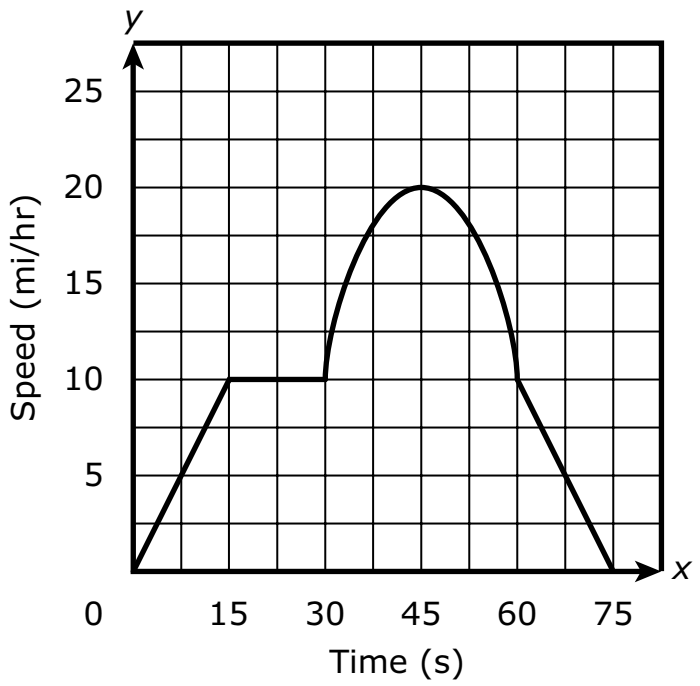
| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Answer Choice Options | | | |
|---|---|---|---|---|---|---|---|
| | | | | A (%) | B (%) | C (%) | D (%) |
| *All Students* | **24,815** | 40% | 0.40 | 20% | 40% | 25% | 16% |
| *Gender* | | | | | | | |
| Female | **12,095** | 38% | 0.38 | 20% | 38% | 26% | 16% |
| Male | **12,720** | 41% | 0.41 | 19% | 41% | 24% | 15% |
| *Ethnicity* | | | | | | | |
| African American | **2,622** | 33% | 0.33 | 24% | 33% | 28% | 15% |
| American Indian or Alaska Native | **30** | 40% | 0.40 | 23% | 40% | 17% | 20% |
| Asian | **510** | 55% | 0.55 | 15% | 55% | 16% | 14% |
| Hispanic or Latino | **2,229** | 38% | 0.38 | 19% | 38% | 27% | 17% |
| Native Hawaiian or Pacific Islander | **47** | 38% | 0.38 | 11% | 38% | 34% | 17% |
| White (non-Hispanic) | **18,118** | 41% | 0.41 | 19% | 41% | 24% | 16% |
| Two or more races | **1,259** | 39% | 0.39 | 21% | 39% | 25% | 15% |
| | | | | | | | |
| Migrant | **103** | 39% | 0.39 | 23% | 39% | 27% | 11% |
| | | | | | | | |
| English Learner | **985** | 32% | 0.32 | 23% | 32% | 30% | 14% |
| | | | | | | | |
| Economically Disadvantaged | **14,619** | 36% | 0.36 | 22% | 36% | 27% | 16% |
| | | | | | | | |
| Students with Disabilities | **1,721** | 33% | 0.33 | 27% | 33% | 26% | 14% |

* Calculator section

**4**

MA0820133_3

Jason rides his bike. The graph represents Jason's speed, in miles per hour, over time, in seconds (s).




Over which interval did Jason's speed decrease at a rate that was **not** constant?

**A** Between 15 seconds and 30 seconds

**B** Between 30 seconds and 45 seconds

**C** Between 45 seconds and 60 seconds

**D** Between 60 seconds and 75 seconds

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820133*
**Book Question Number:** 4

**Standard:** KY.8.F.5.a

**Item Type:** MC
**Key:** C

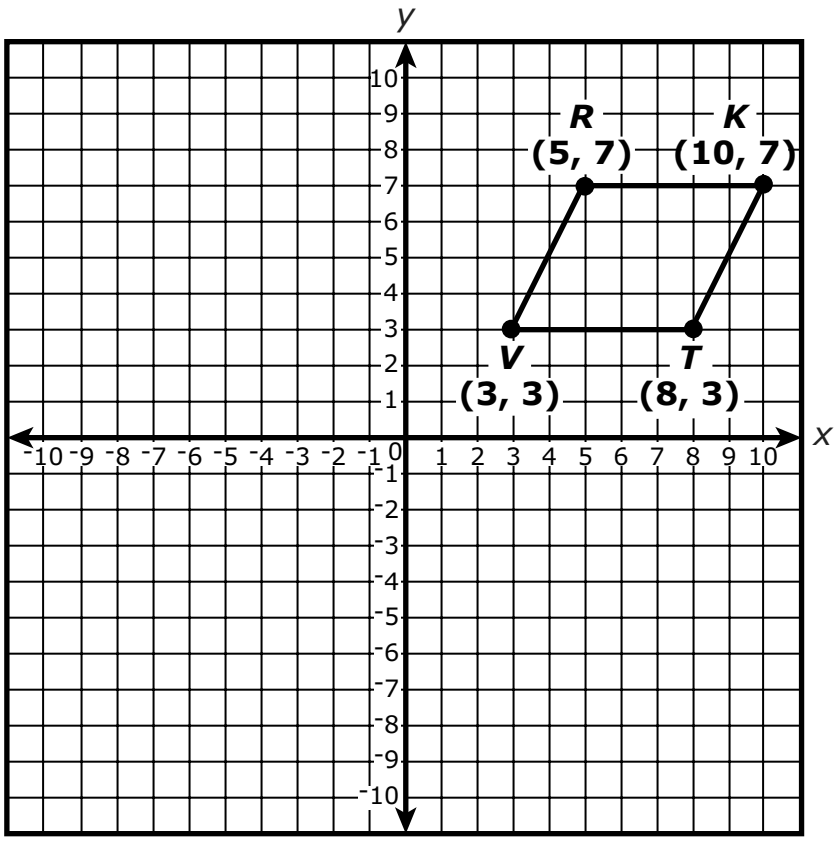
| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Answer Choice Options | | | |
|---|---|---|---|---|---|---|---|
| | | | | A (%) | B (%) | C (%) | D (%) |
| *All Students* | **46,927** | 51% | 0.51 | 18% | 17% | 51% | 15% |
| *Gender* | | | | | | | |
| Female | **22,545** | 48% | 0.48 | 19% | 16% | 48% | 17% |
| Male | **24,382** | 53% | 0.53 | 16% | 17% | 53% | 13% |
| *Ethnicity* | | | | | | | |
| African American | **5,067** | 38% | 0.38 | 22% | 22% | 38% | 18% |
| American Indian or Alaska Native | **66** | 55% | 0.55 | 18% | 15% | 55% | 12% |
| Asian | **923** | 65% | 0.65 | 13% | 11% | 65% | 11% |
| Hispanic or Latino | **4,421** | 43% | 0.43 | 20% | 20% | 43% | 16% |
| Native Hawaiian or Pacific Islander | **91** | 38% | 0.38 | 27% | 21% | 38% | 13% |
| White (non-Hispanic) | **33,966** | 54% | 0.54 | 17% | 16% | 54% | 14% |
| Two or more races | **2,392** | 48% | 0.48 | 18% | 17% | 48% | 17% |
| | | | | | | | |
| Migrant | **241** | 34% | 0.34 | 21% | 25% | 34% | 20% |
| | | | | | | | |
| English Learner | **2,364** | 31% | 0.31 | 24% | 25% | 31% | 20% |
| | | | | | | | |
| Economically Disadvantaged | **28,344** | 44% | 0.44 | 20% | 19% | 44% | 16% |
| | | | | | | | |
| Students with Disabilities | **5,758** | 34% | 0.34 | 24% | 22% | 34% | 19% |

* Calculator section

**5**

MA0820055_4

The coordinate plane shows the location of figure *RKTV*.




The figure *RKTV* is rotated 180 degrees clockwise about the origin to produce figure *R′K′T′V′*. Which rule can be applied to the coordinates of the figure *RKTV* to obtain the coordinates of the figure *R′K′T′V′*?

**A** $(x, \bar{y})$

**B** $(y, \bar{x})$

**C** $(\bar{y}, \bar{x})$

**D** $(\bar{x}, \bar{y})$

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820055*
**Book Question Number:** 5

**Standard:** KY.8.G.3

**Item Type:** MC
**Key:** D

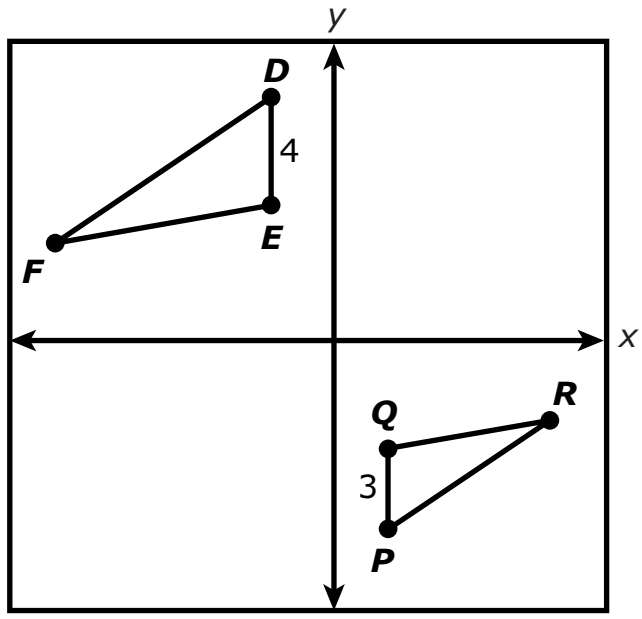
| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Answer Choice Options | | | |
|---|---|---|---|---|---|---|---|
| | | | | A (%) | B (%) | C (%) | D (%) |
| *All Students* | **34,393** | 34% | 0.34 | 20% | 23% | 24% | 34% |
| *Gender* | | | | | | | |
| Female | **16,425** | 35% | 0.35 | 21% | 22% | 23% | 35% |
| Male | **17,968** | 33% | 0.33 | 19% | 24% | 24% | 33% |
| *Ethnicity* | | | | | | | |
| African American | **3,685** | 19% | 0.19 | 25% | 31% | 24% | 19% |
| American Indian or Alaska Native | **55** | 27% | 0.27 | 18% | 27% | 27% | 27% |
| Asian | **685** | 51% | 0.51 | 14% | 17% | 18% | 51% |
| Hispanic or Latino | **3,297** | 28% | 0.28 | 21% | 26% | 25% | 28% |
| Native Hawaiian or Pacific Islander | **70** | 33% | 0.33 | 21% | 27% | 19% | 33% |
| White (non-Hispanic) | **24,853** | 36% | 0.36 | 19% | 22% | 23% | 36% |
| Two or more races | **1,747** | 31% | 0.31 | 22% | 24% | 22% | 31% |
| | | | | | | | |
| Migrant | **194** | 24% | 0.24 | 25% | 26% | 25% | 24% |
| | | | | | | | |
| English Learner | **1,845** | 17% | 0.17 | 25% | 33% | 26% | 17% |
| | | | | | | | |
| Economically Disadvantaged | **20,915** | 28% | 0.28 | 22% | 26% | 24% | 28% |
| | | | | | | | |
| Students with Disabilities | **4,888** | 20% | 0.20 | 26% | 30% | 25% | 20% |

* Calculator section

**6**

MA0820189_2

Triangle *PQR* is similar to triangle *DEF*.




Which statement could describe a sequence of geometric transformations that when applied to triangle *PQR*, will result in triangle *DEF?*

**A** A rotation of 180° about the origin and a dilation with a scale factor of $\frac{3}{4}$

**B** A rotation of 180° about the origin and a dilation with a scale factor of $\frac{4}{3}$

**C** A rotation of 90° clockwise about the origin and a dilation with a scale factor of $\frac{4}{3}$

**D** A rotation of 90° counterclockwise about the origin and a dilation with a scale factor of $\frac{3}{4}$

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820189*
**Book Question Number:** 6

**Standard:** KY.8.G.4

**Item Type:** MC
**Key:** B

| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Answer Choice Options | | | |
|---|---|---|---|---|---|---|---|
| | | | | A (%) | B (%) | C (%) | D (%) |
| *All Students* | **24,842** | 37% | 0.37 | 39% | 37% | 14% | 10% |
| *Gender* | | | | | | | |
| Female | **12,109** | 35% | 0.35 | 38% | 35% | 15% | 12% |
| Male | **12,733** | 39% | 0.39 | 40% | 39% | 12% | 8% |
| *Ethnicity* | | | | | | | |
| African American | **2,552** | 33% | 0.33 | 33% | 33% | 21% | 13% |
| American Indian or Alaska Native | **38** | 26% | 0.26 | 47% | 26% | 8% | 18% |
| Asian | **507** | 50% | 0.50 | 34% | 50% | 8% | 7% |
| Hispanic or Latino | **2,182** | 34% | 0.34 | 37% | 34% | 18% | 12% |
| Native Hawaiian or Pacific Islander | **46** | 37% | 0.37 | 28% | 37% | 26% | 9% |
| White (non-Hispanic) | **18,230** | 38% | 0.38 | 40% | 38% | 12% | 9% |
| Two or more races | **1,287** | 35% | 0.35 | 38% | 35% | 16% | 10% |
| | | | | | | | |
| Migrant | **109** | 33% | 0.33 | 39% | 33% | 15% | 13% |
| | | | | | | | |
| English Learner | **890** | 33% | 0.33 | 30% | 33% | 23% | 14% |
| | | | | | | | |
| Economically Disadvantaged | **14,634** | 34% | 0.34 | 38% | 34% | 16% | 12% |
| | | | | | | | |
| Students with Disabilities | **1,779** | 35% | 0.35 | 33% | 35% | 20% | 12% |

* Calculator section

**7**

MA0820082_:

The equation $y = \frac{-35}{3}x + 100$ represents the relationship between the total percent of battery charge, $y$, on a laptop, $x$ hours after being removed from the charger.

**Part A**

What are the slope and the $y$-intercept? Explain their meanings in the context of the problem.

Enter your answers and your explanations in the space provided.

**Part B**

If the battery has a full charge at 8:00 a.m., at approximately what time will the battery have no charge? Explain how you determined your answer.

Enter your answer and your explanation in the space provided.

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820082*
**Book Question Number:** 7

**Standard:** KY.8.SP.3

**Item Type:** ER
**Key:** Rubric

| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Score Percentages | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Score 0 (%) | Score 1(%) | Score 2 (%) | Score 3 (%) | Score 4 (%) |
| *All Students* | **23,361** | 19.9% | 0.79 | 55% | 25% | 10% | 6% | 4% |
| *Gender* | | | | | | | | |
| Female | **11,510** | 20.7% | 0.83 | 52% | 28% | 10% | 6% | 4% |
| Male | **11,851** | 19.1% | 0.76 | 58% | 23% | 9% | 6% | 4% |
| *Ethnicity* | | | | | | | | |
| African American | **2,367** | 8.3% | 0.33 | 77% | 16% | 4% | 2% | 1% |
| American Indian or Alaska Native | **29** | 18.1% | 0.72 | 55% | 34% | 0% | 3% | 7% |
| Asian | **464** | 37.2% | 1.49 | 30% | 30% | 13% | 15% | 12% |
| Hispanic or Latino | **2,024** | 13.9% | 0.56 | 66% | 21% | 7% | 4% | 2% |
| Native Hawaiian or Pacific Islander | **40** | 22.5% | 0.90 | 50% | 25% | 13% | 10% | 3% |
| White (non-Hispanic) | **17,209** | 21.8% | 0.87 | 51% | 27% | 11% | 7% | 5% |
| Two or more races | **1,228** | 17.5% | 0.70 | 59% | 24% | 9% | 5% | 3% |
| | | | | | | | | |
| Migrant | **94** | 10.1% | 0.40 | 70% | 22% | 5% | 1% | 1% |
| | | | | | | | | |
| English Learner | **842** | 5.4% | 0.21 | 83% | 14% | 2% | 1% | 0% |
| | | | | | | | | |
| Economically Disadvantaged | **13,632** | 14.3% | 0.57 | 64% | 23% | 7% | 4% | 2% |
| | | | | | | | | |
| Students with Disabilities | **1,651** | 8.3% | 0.33 | 78% | 15% | 4% | 2% | 1% |

* Calculator section

# Rubric

| Rubric | |
|---|---|
| **Score Point 4** | Student scores 4 points. |
| **Score Point 3** | Student scores 3 or 3.5 points. |
| **Score Point 2** | Student scores 2 or 2.5 points. |
| **Score Point 1** | Student scores 0.5, 1, or 1.5 points. **OR**<br>Student demonstrates a minimal understanding of interpreting the meaning of a linear function using bivariate data. |
| **Score Point 0** | Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task. |
| **Blank** | No student response. |
| **Score Points** | **Part A**<br>• Score 2 points:<br>  ○ Identified the y-intercept with the correct meaning and the slope with the correct meaning.<br>• Score 1.5 points:<br>  ○ Identified the y-intercept with the correct meaning and the slope with no reference to the context. **OR**<br>  ○ Identified the slope with the correct meaning and the y-intercept with no reference to the context.<br>• Score 1 point:<br>  ○ Identified the y-intercept OR the slope with correct reference to the context.<br>• Score 0.5 point:<br>  ○ Identified the y-intercept and the slope with no reference to the context.<br>**Part B**<br>• Score 2 points:<br>  ○ Correct approximate time and complete explanation or work shown.<br>• Score 1.5 points:<br>  ○ Correct approximate time and partial explanation or work shown. **OR**<br>  ○ Complete explanation/work shown but does not convert to time<br>• Score 1 point:<br>  ○ Correct answer without explanation or work.<br>• Score 0.5 point:<br>  ○ Incorrect answer which demonstrates some understanding of the task. |
| **Correct Answers** | **Part A**<br>The slope of the equation is $\frac{-35}{3}$ and it means that for every 3 hours the laptop is not charging, the battery charge decreases by 35%.<br>The y-intercept of the equation is (0,100) and it means that initially (time=0), the phone was fully charged. (100%)<br>**Part B**<br>$0=(\frac{-35}{3})x+100$<br>8.6=x<br>After approximately 8.6 hours the battery will have no charge. This will be at approximately 4:36 p.m. |

# Anchor Set

## A1

**Part A**

slope is –35 and the y intersaept is 3

**Part B**

At 6 p.m. the battery will have no charge.

**Anchor Annotation, Paper 1**
**Score Point 0**

**Part A score 0:**
The response is incorrect.

**Part B score 0:**
The response provides an incorrect answer.

## A2

**Part A**

Slope is the amount changing in a situation.

**Part B**

At 8:00pm the battery will have no charge.

**Anchor Annotation, Paper 2**
**Score Point 0**

**Part A score 0:**
The response is not sufficient for credit.

**Part B score 0:**
The response provides an incorrect answer.

# A3

**Part A**

It would be a negative slope

**Part B**

i think it would be around 8 or 9 o'clock.

**Anchor Annotation, Paper 3**
**Score Point 0**

**Part A score 0:**
The response is not sufficient for credit.

**Part B score 0:**
The response provides an incorrect answer.

# A4

**Part A**

The slope of the graph is 5/1. The y-intercept is (0,100).

**Part B**

The laptop will die between 4:57 P.M. and 4:58 P.M. I determined this by putting munbers in the X spot for the equation and the closest I got to zero was between 8.57 and 8.58, and due to the fact there are 60 minutes in an hour, the time is 4:57 and 4:58.

**Anchor Annotation, Paper 4**
**Score Point 1**

**Part A score 0:**
The response provides the correct y-intercept (0,100). The slope is not correct and neither context is provided.

**Part B score 1:**
- The response includes a reasonable answer based on the method used (4:57 and 4:58).

The response demonstrates partial understanding. The time is determined through guess and check by substituting in for x, resulting in a reasonable time in hours (8.57 and 8.58). The final conversion from hours to time is incorrect (57% of an hour = 57 minutes).

# A5

**Part A**

Slope: -(35/3)

(y-intercept) : 100

X is hours, you mutiple how many hours with -(35/3) and then you add 100 to find the total percent of battery thats charge.

**Part B**

It takes .000000001 hours to charge to 100%.  It was probably at 7:00 when it was at 0 percent.

**Anchor Annotation, Paper 5**
**Score Point 1**

**Part A score 0.5:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).

Neither of the values are defined in context.

**Part B score 0:**
The response gives an incorrect answer and explanation.

Per the rubric, a total of .5 points earned results in a score of 1.

# A6

**Part A**

y-intercept = 100 it is also the starting percent for the laptop

Slope =11.66 it is the change in percent

**Part B**

12:00

**Anchor Annotation, Paper 6**
**Score Point 1**

**Part A score 1:**

- The response provides the y-intercept (100) along with the context (starting percent for the laptop).

The slope value and context are incorrect as they do not include the negative and/or that it is the rate of decrease in percentage.

**Part B score 0:**
The response provides an incorrect answer.

**Part A**

The slope of the equation is -(35/3) and the y-intercept is 100. The slope - (35/3) is the rate the battery is going down per hour. The 100 represents the total amount it starts with after being unplugged.

**Part B**

It will have no charge left at 1:02 am. I figures this out by doing the equation and just using substitution. So first I started plugging numbers into x until it finally got down to 17.2. Then I did -(35/30) times 17.2+100 which equals –100 so that means the computer would have no charge left.

## Anchor Annotation, Paper 7
## Score Point 2

**Part A score 2:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).
- An explanation is given for both the slope (rate the battery is going down per hour) and the y-intercept (total amount it starts with after being unplugged).

**Part B score 0:**
The response provides an incorrect answer and an explanation that is incorrect or vague.

**Part A**

The slope is - (35 / 3). The slope is how much it is going up or down each time, in this case it is going down. The y intercept is 100. This means that it starts with 100 and then goes down the slope. In this case the battery starts at 100 percent and goes down 35 percent every 3 hours.

**Part B**

In about 7 hours the battery will have no charge because every 3 hours it goes down 35 percent. And 35 can fit into 100 two times. 2 x 3 = 6 but there would be some battery left so it would take more time to fully run out of battery adding another hour.

**Anchor Annotation, Paper 8**
**Score Point 2**

**Part A score 2:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).
- An explanation is given for both the slope (goes down 35 percent evry 3 hours) and the y-intercept (battery starts at 100 percent).

**Part B score 0.5:**

- The response provides an incorrect answer with an explanation that shows some understanding. The response demonstrates the beginning of a correct process (35 can fit into 100 two times. 2x3 = 6).

It makes an unreasonable estimate of the time for the last % and does not convert the result into a time.

Per the rubric, a total of 2.5 points receives a score of 2.

**Part A**

The slope is -(35/3), and the $y$ intercept is 100. These are required to graph and solve for a value.

**Part B**

You can solve it by solving for $y = 0$ in the equation.

0= -(35/3)x+100

-100= -(35/3)x

-300=-35x

300/35=x

X=8 4/7

The battery will have no charge at about 4:34 pm.

**Anchor Annotation, Paper 9**
**Score Point 2**

**Part A score 0.5:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).

An explanation of these values is not included.

**Part B score 2:**

- The response provides a reasonable approximate time (4:34).
- A complete explanation is given by substituting 0 in for y and solving.

Per the rubric, a total of 2.5 points receives a score of 2.

**Part A**

The y-intercept is a term used for the initial value in a situation. In this case the initial battery power is the y intercept, 100.

The slope is a term used for the rate of change. So how much power was lost every hour after being off charge. In this situation the slope is -(35/3).

**Part B**

Around 4:30 p.m the laptop will be completely dead. This can be found using the equation

y=-(35/3)x+100.

Substitute 8.5 in for x and the answer will be close to zero, meaning the charge would be almost dead.

**Anchor Annotation, Paper 10**
**Score Point 3**

**Part A score 2:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).
- An explanation is given for both the slope (how much power was lost every hour after being off charge) and the y-intercept (initial battery power).

**Part B score 1:**

- The response provides a reasonable approximate time (4:30).

The explanation does not explain how that answer was derived, it only gives a method to check the answer afterwards.

**Part A**

The slope is -(35/3), and it represents how the battery charge decreases over time. The *y -intercept* is 100. It represents the starting percentage of the battery.

**Part B**

The slope, when divided, equals approximately –12. This means that the battery will discharge 12% per hour. Dividing 100 by 12 equals 8.3 repeating. The battery will last 8.3 hours on a single charge.

## Anchor Annotation, Paper 11
## Score Point 3

**Part A score 2:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).
- An explanation is given for both the slope (how the battery decreases over time) and the y-intercept (starting percentage of the battery).

**Part B score 1.5:**

- The response provides a complete explanation of how to find the number of hours.

The response does not convert the number of hours to a time.

Per the rubric, a total of 3.5 points receives a score of 3.

**Part A**

Slope is the rate of change(at what rate it is going to change) and y intercept is the starting point. 100 is the y intercept because that's what percentage the battery is good to start at. The y intercept never has a variable because the starting point never changes. Slope on the other hand always has a variable because that tells you how much you've changed. The slope in this problem is -(35/3)x and the x is going to determine how much it changes.

**Part B**

-(35/3) = -11.66666667

At 9:00 a.m., the battery will be at 88.33333333%. At 10:00 a.m., the battery will be at 76.66666666%. At 11:00 a.m., the battery will be at 65%. After 6 hours, at 2:00 p.m., the battery will be at 30%. At 3:00 p.m., the battery will be at 18.3333333333%. At 4:00 p.m., the battery will be at 6.666666666%. At approximately 4:30 p.m., there will be no charge left. I know that because 6.6666666 is about in the middle of 11.66666666 which is a full hour. That means it will only take half an hour after 4:00 p.m. for the laptop to have no charge.

## Anchor Annotation, Paper 12
## Score Point 3

**Part A score 1:**

- The response provides the correct y-intercept (100).
- An explanation is given for the y-intercept (what percentage the battery is going to start at).

The slope is incorrect [-(35/3)x] as it includes the variable x and the response indicates that the variable x is considered part of the slope. The explanation for slope is too vague.

Note that including the x with the slope is considered a minor error that does not detract if it does not provide further evidence that the variable x is part of the slope.

Compare this response to Part A in Anchor 13.

**Part B score 2:**

- The response provides a reasonable approximate time (4:30).
- A complete explanation is given through counting down to 0 using the rate of change with a reasonable estimate of the last % of an hour.

**Part A**

The slope is the value at which the linear line changes, it makes the line have its tilt, this value, is

-(35/3)x. In the case of this problem, the Slope is the rate of depletion the battery has while being off of the charger.

The y intercept is the value at which the Linear line crosses on the y axis. This value is 100. In the case of this problem the y intercept is the full charge of the battery before the depletion takes affect on it.

**Part B**

If the batter was at full charge at 8:00 A.M. Then by approximately 4:38 P.M, the charge would hit the 0 and it would run out of battery. I did this equation by a little bit of guessing and checking.

I took the equation -(35/3)x and kept changing the x till i got the lowest possible value above zero, this was 8, then i had to add a decimal and find the next lowest value to be the minutes, this was 5. Now since numarical values and time values are different, converting numbers into values would be especially easy with a 5. So far, i have 8 hours and 30 minutes, Now on to the singular digit minute, with this, i found the lowest value before negetives, this is because the question asks for when it dies in approximate time, and not "Before it dies". Doing this, would mean i would have a close approximate to its shutting off. When i did do the time, i got 7 as a value, this would mean that i would have to put it over 100, get .07, take that as 7%, put that over 60 and got 8 minutes, which at last, left me with 8 hour 38 minutes, the time at which the labtop would shut down due to lack of power.

**Anchor Annotation, Paper 13**
**Score Point 4**

**Part A score 2:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).
- An explanation is given for both the slope (rate of depletion the battery has while being off of the charger) and the y-intercept (full charge of the battery before the depletion takes affect on it).

Note that including the x with the slope should be considered a minor error that does not detract from the score if the response does not provide further evidence that they think the variable x is part of the slope.

Compare this response to Part A in Anchor 12.

**Part B score 2:**

- The response provides a reasonable approximate time (4:36).
- A complete explanation is given through guess and check by substituting in for x until y=0.

**Part A**

The slope of the line is - (35/3). This tells that the battery power reduces by 35 every 3 hours after removing the charger.

The $y$ intercept is (0,100). This tells that the battery power starts at 100% or at full charge.

**Part B**

It will have no charge at **4:34 pm.** I calculate this by solving for x when y equaled 0 since y represented 0% charge. When I solved it I came to "-100= -(35/3)x and when I solved for x, I got 8.571428571. I took the whole number 8 and added that to the hours which is 16, or in terms of time, 4. Then I took 0.571428571 and multiplied it by 60, since the decimal is a fraction of an hour, and I got 34.28. I rounded it to 34 and added that to the minutes part of 4:00 pm and got **4:34 pm** as my final answer.

**Anchor Annotation, Paper 14**
**Score Point 4**

**Part A score 2:**

- The response provides the correct slope [-(35/3)] and y-intercept (100).
- An explanation is given for both the slope (battery power reduces by 35 every 3 hours after removing the charger) and the y-intercept (battery power starts at 100% or at full charge).

**Part B score 2:**

- The response provides a reasonable approximate time (4:34).
- A complete explanation is given by substituting 0 in for y and solving.

**Part A**

The slope of the equation is -(35/3). The slope is how much the battery goes down after x hours removed from the charger. The y intercept for the equation is 100. The y intercept is the amount of battery at a full charge. When the slope multiplied by x hours is added to the y intercept you get how much battery charge is left.

**Part B**

The battery will have no charge at 4:36 p.m. I figured this out by setting the equation equal to 0. I then subtracted the 100 to get that $-100=-35/3x$. Next I divided –100 by -(35/3). This gave me that x was equal to 8.6 hours. I the added 8.6 hours to 8 a.m. to get 4:36 p.m.

## Anchor Annotation, Paper 15
## Score Point 4

**Part A score 2:**

The response provides the correct slope [-(35/3)] and y-intercept (100).

- An explanation is given for both the slope (how much the battery goes down after x hours removed from the charger) and the y-intercept (the amout of battery at a full charge).

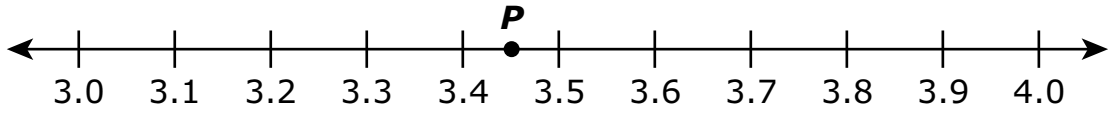
**Part B score 2:**

- The response provides a reasonable approximate time (4:36).
- A complete explanation is given (substituting 0 in for y and solving).

**8**

MA0820097_3

The point $P$ on the number line shows the approximate location of the irrational number $\sqrt{k+2}$.




What is the approximate value of $k$?

**A** 1.45

**B** 5

**C** 10

**D** 11.9



STOP

# Released Item Performance

## Kentucky Summative Assessments

**Spring 2024**
**Grade 8**
**Mathematics**

**Item:** MA0820097*
**Book Question Number:** 8

**Standard:** KY.8.NS.2

**Item Type:** MC
**Key:** C

| Student Group | Number of Students | Percent Correct | Average Item Score | Item Breakout Statistics - Answer Choice Options | | | |
|---|---|---|---|---|---|---|---|
| | | | | A (%) | B (%) | C (%) | D (%) |
| *All Students* | **22,114** | 28% | 0.28 | 45% | 19% | 28% | 8% |
| *Gender* | | | | | | | |
| Female | **10,450** | 28% | 0.28 | 45% | 18% | 28% | 8% |
| Male | **11,664** | 27% | 0.27 | 45% | 19% | 27% | 8% |
| *Ethnicity* | | | | | | | |
| African American | **2,519** | 21% | 0.21 | 45% | 25% | 21% | 9% |
| American Indian or Alaska Native | **28** | 25% | 0.25 | 46% | 21% | 25% | 7% |
| Asian | **418** | 41% | 0.41 | 37% | 14% | 41% | 8% |
| Hispanic or Latino | **2,242** | 23% | 0.23 | 45% | 23% | 23% | 9% |
| Native Hawaiian or Pacific Islander | **45** | 29% | 0.29 | 36% | 27% | 29% | 9% |
| White (non-Hispanic) | **15,753** | 29% | 0.29 | 46% | 17% | 29% | 8% |
| Two or more races | **1,108** | 25% | 0.25 | 47% | 20% | 25% | 8% |
| | | | | | | | |
| Migrant | **134** | 17% | 0.17 | 48% | 25% | 17% | 10% |
| | | | | | | | |
| English Learner | **1,474** | 18% | 0.18 | 45% | 28% | 18% | 9% |
| | | | | | | | |
| Economically Disadvantaged | **13,734** | 23% | 0.23 | 48% | 21% | 23% | 8% |
| | | | | | | | |
| Students with Disabilities | **3,984** | 19% | 0.19 | 46% | 25% | 19% | 10% |

* Calculator section


*Investing in Kentucky's Future, One Student at a Time*

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