

High-Quality Mathematics Items Module (Grades 6-8)

The pages that follow contain a selection of items from chapter assessments in grades 6-8. These items are representative of the range available in many textbook series. This activity is designed to help teachers think about how they can revise chapter tests to better align to the Standards. Each item below can be revised to more closely embody the characteristics described in the High-Quality Mathematics Items Modules.

1. Solve all of the items.
2. Take a close look at each item, thinking about what the modules explain about expectations of high-quality mathematics items. Focus on the following features:
 - a. If the item aligns to a Supporting Work standard, does the item connect to Major Work? (Principle 1)
 - b. Does the item align to the aspect of rigor targeted in the Standards? (Principle 2)
 - c. Does the item align to the grade-level expectations? (Principle 3)
 - d. Does the item address the central concern of the identified standard? (Principle 4)
 - e. If the item aligns to a Standard for Mathematical Practice, is the item appropriate to the grade? (Principle 7)
 - f. Does the item type/format of the item match the content? (Principle 8)
3. Using the chart below, record your thoughts about which Alignment Principle can be used to improve each item.
4. With the Alignment Principle in mind, revise the item.
5. After time for individual reflection, discuss your findings and your proposed revision with your colleagues.

Answer Key:

| Standard | Item | Assessment Principle? | Revised Item |
|---|---|-----------------------|--------------|
| <p>6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.</p> | <p>Theresa signed up for a new phone plan. She has to pay \$74.99 a month, which includes all phone calls. Text messages cost an additional 2 cents each. Which equation represents how many text messages she sent if her phone bill was \$76.35, and y represents the number of text messages she sent that month?</p> <p>a) $74.99 + 0.02y = 76.35$ b) $74.99 + .2y = 76.35$ c) $76.35 + 0.02y = 74.99$ d) $76.35 = 74.99 - 0.02y$</p> | | |
| <p>6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</p> | <p>Find the quotient:</p> <p>$100 \div \frac{2}{3} =$</p> <p>a) $\frac{200}{3}$ b) $\frac{300}{200}$ c) $\frac{50}{3}$ d) $\frac{300}{2}$</p> | | |

6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Which coordinate grid shows the trapezoid formed by the following points?

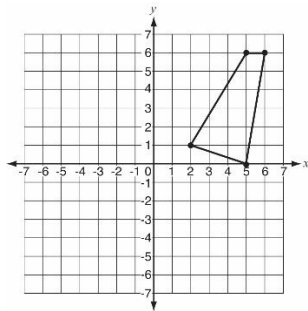
$(-2, 6)$

$(-2, -1)$

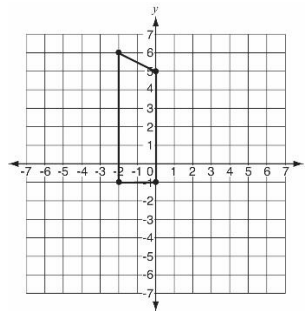
$(5, 6)$

$(5, 0)$

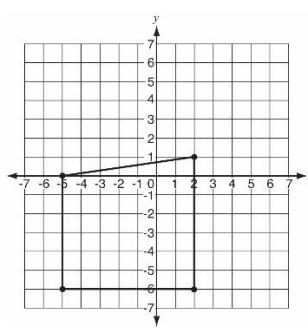
a)



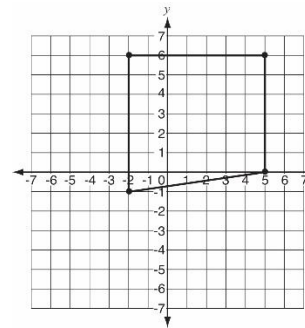
b)



c)



d)



| | | | |
|---|---|--|--|
| <p>7. SP.A Use random sampling to draw inferences about a population.</p> | <p>Jean wants to find out information about whether more students at her middle school have brothers or sisters. She knows she can't ask all 700 students in her school. Which would be the most effective way to sample the student population?</p> <ul style="list-style-type: none"> a) Talk to every 10th student that walks out of the building after school b) Survey all students who have math 1st period c) Survey all the students who ride the bus with her d) Talk to 20 students in each grade | | |
| <p>8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.</p> | <p>What is the fraction notation for $0.\overline{22}$?</p> <ul style="list-style-type: none"> a) $\frac{1}{2}$ b) $\frac{1}{9}$ c) $\frac{2}{9}$ d) $\frac{2}{11}$ | | |

8.EE.C.7b

Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Solve for x. On each line, explain the step you used to create an equivalent equation.

| Equation | Justification |
|--|-------------------|
| $\frac{1}{5}(3x - 9) + .8 = \frac{5}{6}x + 10$ | Original equation |
| | |
| | |
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| | |

MP.4 Model with
mathematics.

(7th grade)

This table represents the cost of renting a truck from Moving Company X and Moving Company Y. Each company charges a one-time rental fee plus a charge for each mile driven.

| Moving Company | One-time Rental Fee | Charge per Mile |
|----------------|---------------------|-----------------|
| X | \$150 | \$0.25 |
| Y | \$ 50 | \$0.75 |

Graph two linear equations that represent the cost of using each moving company given a number of miles driven.

