The University of Texas at Austin
Charles A. Dana Center

Got Innovative Assessments?

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About the Dana Center

– Equity — Access — Excellence –

2018

Dana Center by the Numbers

We supported 60,500 K-12 students attending school on U.S. military bases through our work with the **U.S. Department of Defense Education Activity**.

Dana Center by the Numbers

By the close of 2017, the Dana Center had contributed to the **implementation of math pathways** in higher education systems, institutions, and campuses in 29 states.

Dana Center by the Numbers

We engaged with 118 districts in 23 states to provide middle and high school math courses of the **highest quality**, as recognized by rigorous national and state reviews, including EdReports.org, Louisiana Department of Education, and Texas Education Agency panels.

Innovative Assessments

Session goals

In this session, we will:

- **Understand the benefits of technology-enhanced assessment items.**
- **Analyze and engage with assessment items.**
- **Apply formative assessment strategies to multiple choice items.**

What Is Formative Assessment?

Formative assessment is…

"…a planned process in which assessment-elicited evidence of students' status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their learning tactics."

Page 6 in Popham, W. James. (2008). *Transformative assessment*. ASCD.

Formative assessment depends on collecting data and on taking action based on the data collected.

Innovative Assessments

Technology-enhanced assessment items

- Capture evidence of mathematical thinking.
- Assess processes, not just outcomes.
- Enhance engagement and motivation.
- Increase the cognitive load.
- Provide timely feedback to students, teachers, and schools.

Innovative Assessments

We collaborate with education company Agile Mind to develop and provide a system of comprehensive programs in mathematics and science for teaching and learning.

Open access sites with examples:

http://ccsstoolbox.com/

http://www.agilemind.com/programs/agile-assessment/

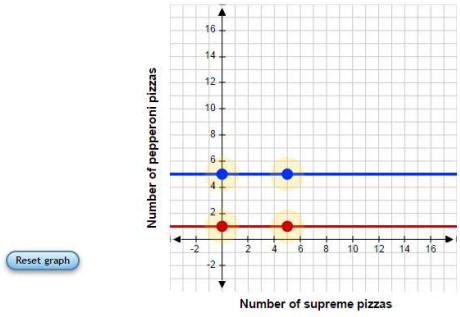
Innovative Assessments

Analyzing some sample items

- What does the item assess?
- What evidence does the item elicit about what students know or don't know?
- How would you use this item?

Sample Items

Lani is buying pepperoni and supreme pizzas for a party. A pepperoni pizza costs $10 and a supreme pizza costs $12. Lani wants to buy 14 pizzas and spend $150. Drag the points on the two lines to graph the system of equations that represents this problem, given that the independent variable represents the number of supreme pizzas and the dependent variable represents the number of pepperoni pizzas. Then fill in the blanks to show how many of each type of pizza Lani will order.



Reset graph

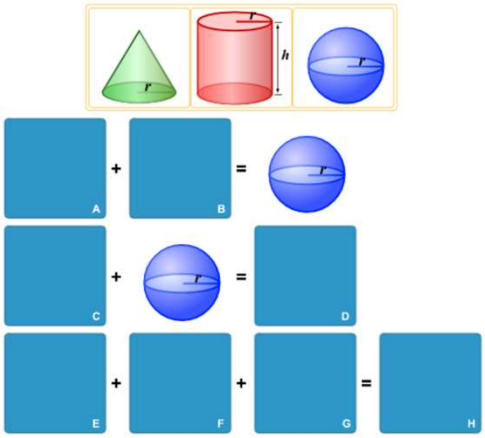
Lani will buy [A] pepperoni pizzas and [B] supreme pizzas.

Hint Submit Answer

Source: Agile Assessment - http://www.agilemind.com/programs/agile-assessment/

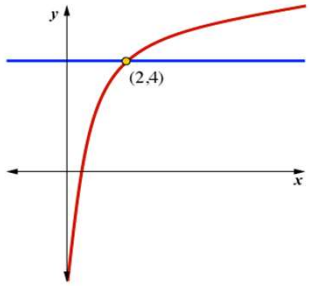
Sample Items

These three solids have the same radius, and the cylinder and cone each have a height equal to the diameter of the sphere. Drag the figures to model relationships among them in terms of volume.



Source: Agile Assessment - http://www.agilemind.com/programs/agile-assessment/

Sample Items



The graphs of the functions $f(x) = 4$ and $g(x) = 3 + \log_b x$ are shown. Based on the graphs, which statements are true? Select all that apply.

- ☐ The base of the logarithmic function graphed is 3.
- ☐ The solution to the equation $3 + \log_b x = 2$ is $x = 4$.
- ☐ The solution to the equation $3 + \log_b x = 4$ is $x = 2$.
- ☐ The base of the logarithmic function graphed is 2.

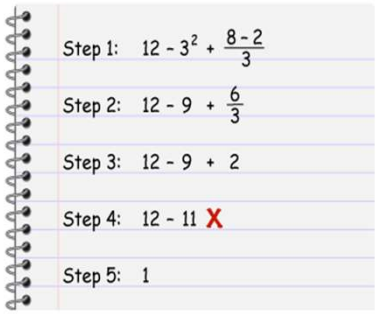
Sample Items – Worked Examples

Hudson tried to simplify an expression but he made a mistake in step 4. His teacher marked the mistake with an X.

a. Why do you think Hudson added the 9 and 2 before subtracting?

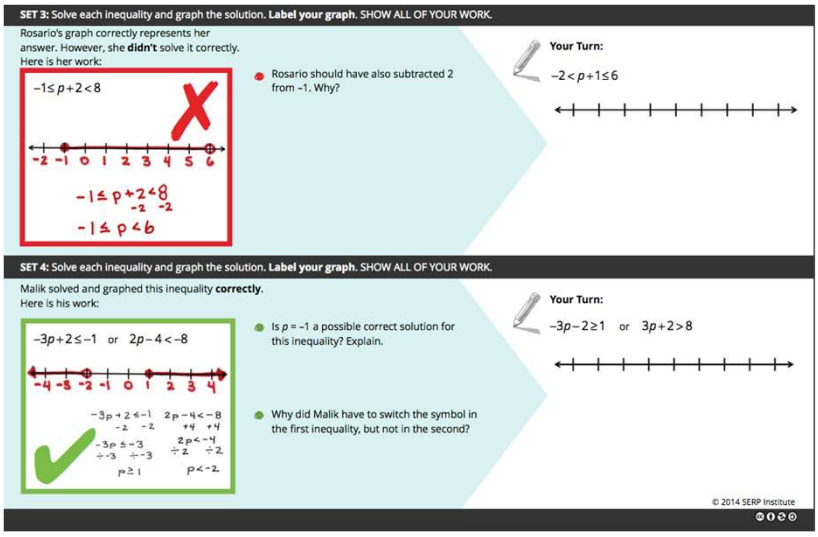
b. Explain to Hudson why this is incorrect.

c. Find the correct simplified expression.



Enter your response in the space below. Use the equation editor in the tool bar to help you type mathematical symbols and notation as needed.

Algebra by Example



Sample Items – Golf Balls in Water

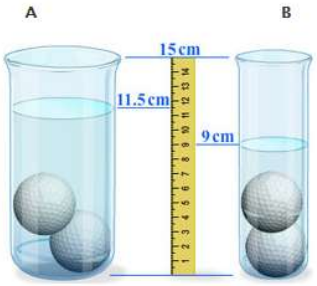
http://www.ccsstoolbox.org/

Write your answers to the following problem in your answer booklet.

Tom repeats his experiment with a different glass jar. The new glass jar, B, has a smaller radius than the original glass jar, A.

Data from Experiment with Glass Jar A

Number of golf balls, x	Height of water in centimeters, y
0	9.0
1	10.2
2	11.5
3	12.7
4	13.8



Released STAAR Item Algebra I 2017

33 Researchers in Antarctica discovered a warm sea current under a glacier that is causing the glacier to melt. The ice shelf of the glacier had a thickness of approximately 450 m when it was first discovered. The thickness of the ice shelf is decreasing at an average rate of 0.06 m per day.

Which function can be used to find the thickness of the ice shelf in meters x days since the discovery?

A $t(x) = 450 - 0.06x$

B $t(x) = -0.06(x + 450)$

C $t(x) = 450 + 0.06x$

D $t(x) = 0.06(x + 450)$

Innovative Assessments

Researchers in Antarctica discovered a warm sea current under a glacier that is causing the glacier to melt. The ice shelf of the glacier had a thickness of approximately 450 m when it was first discovered. The thickness of the ice shelf is decreasing at an average rate of 0.06 m per day.

Which function can be used to find the thickness of the ice shelf in meters x days since the discovery? Select all that apply.

A. t(x)= 450-0.06x
B. t(x)= 0.06(x+450)
C. t(x)= -0.06(x-7500)
D. t(x)= 450 + 0.06x
E. t(x)= -0.06(x+450)

Innovative Assessments

Researchers in Antarctica discovered a warm sea current under a glacier that is causing the glacier to melt. The ice shelf of the glacier had a thickness of approximately 450 m when it was first discovered. The thickness of the ice shelf is decreasing at an average rate of 0.06 m per day. The thickness of the glacier after x days can be described by the function rule f(x)=-0.06x+450.

Marcos wrote and solved an equation to find the number of days it will take for the glacier to have a thickness of 444 m. He worked it correctly, but was confused about his answer in line 2. Explain to Marcos why his answer in line 2 makes sense.

line 1: $444 = -0.06x+450$
line 2: $-6 = -0.06x$
line 3: $100 = x$

Innovative Assessments

Researchers in Antarctica discovered a warm sea current under a glacier that is causing the glacier to melt. The ice shelf of the glacier had a thickness of approximately 450 m when it was first discovered. The thickness of the ice shelf is decreasing at an average rate of 0.06 m per day.

Read this situation. Describe in your own words what is happening. Write the description as if you are explaining it to a friend.

Innovative Assessments

Researchers in Antarctica discovered a warm sea current under a glacier that is causing the glacier to melt. The ice shelf of the glacier had a thickness of approximately 450 m when it was first discovered. The thickness of the ice shelf is decreasing at an average rate of 0.06 m per day.

Bon wrote this description. Fill in the blanks with the correct information.

They begin measuring the thickness of the glacier when it is at _____m. Each day it _____ an average of 0.06 m. So after 1 day the thickness is ___m. After 1 week the thickness is _____m.

Innovative Assessments

THIS IS NOT a suggestion that ALL you do is an extension of MC items.

Instruction should be a RICH environment of MANY experiences.

Rather, this approach says,

"If a multiple choice item is worthy of attention, what formative assessment can we wrap around it to elicit the MOST evidence?"

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