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A farmer has two water tanks that drain at a rate of 2.5 gallons per minute. He is considering replacing the existing tanks with new ones, either Model S or Model T. Information about the new tanks is shown below. Each tank holds 100 gallons of water and drains at a constant rate.

Model S Drainage Rate

| Time <br> (minutes) | Quantity <br> (gallons) |
| :---: | :---: |
| 0 | 100 |
| 6 | 82 |

Model T Drainage Rate


Which statement below is true about the drainage rates of the new tanks?

A Both Model S and Model T drain faster than the existing tanks.
B Both Model S and Model T drain slower than the existing tanks.
C Model S drains faster and Model T drains slower than the existing tanks.
D Model S drains slower and Model T drains faster than the existing tanks.

## 2

In the diagram below, Image 2 is a triangle that is the result of reflecting scalene $\Delta J K M$ first over $l_{1}$ and then over $l_{2}$.


The angles of Image 2 are $\angle 1, \angle 2$, and $\angle 3$. Which one of the following is true?

A $\angle J \cong \angle 1$ and $\angle M \cong \angle 3$
B $\angle J \cong \angle 3$ and $\angle M \cong \angle 1$
C $\angle K \cong \angle 1$ and $\angle M \cong \angle 3$
D $\angle K \cong \angle 3$ and $\angle M \cong \angle 1$

An airport terminal runs shuttle buses to different parts of the airport. The scatter plot shows the times for each part of the airport and a number of round trips.

Shuttle Bus Runs


Which equation is closest to the line of best fit for this data?

A $y=\frac{3}{5} x+1$
B $y=\frac{3}{2} x+1$
C $y=\frac{3}{4} x+2$
D $y=\frac{5}{4} x+2$


Which graph represents the equation below?

$$
y=-2 x+1
$$



A


B


C


D

## 6

A student is comparing three cylinders. The dimensions of the three cylinders are listed below.

- First cylinder has a height of 9 inches and a diameter of 4 inches.
- Second cylinder has a height of 3 inches and a diameter of 4 inches.
- Third cylinder has a height of 9 inches and its volume is $\frac{1}{4}$ the volume of the first cylinder.

Part A How does the volume of the second cylinder compare to the volume of the first cylinder? Explain your answer using the formula for the volume of a cylinder.

Part B How does the diameter of the third cylinder compare to the diameter of the first cylinder? Explain your answer.

David wants to purchase some pens. The pens he likes cost $\$ 2$ each, not including tax. This is represented by the graph in the coordinate plane below.


Part A Write an equation for the graph of the line.
Part B Explain how similar triangles $\triangle A B C$ and $\triangle D B E$ formed by the graph, dashed lines, and $x$-axis are similar in relation to the number of pens purchased and the cost.

Vincent wants to have balloons delivered to a friend. He can choose between two stores.

- Store J charges $\$ 70.00$ for delivery, plus $\$ 2.50$ per balloon delivered.
- Store K charges $\$ 60.00$ for delivery, plus $\$ 5.00$ per balloon delivered.

The equations below represent the charges at the two stores, where $C$ represents the total charge for delivering $b$ balloons.
$C=2.5 b+70$
$C=5 b+60$

Part A On your answer document, copy the coordinate plane below. Graph the two given equations on the coordinate plane. Estimate the solution using your graph.

Two Balloon Stores


Part B Solve the system of equations to algebraically verify the solution you graphed in part $\mathbf{A}$.

Item Information

| Question Number | Key | DOK* | KCAS Primary <br> Standard** |
| :---: | :---: | :---: | :---: |
| 1 | A | 2 | $8 . F .2$ |
| 2 | D | 2 | $8 . G .1 . b$ |
| 3 | A | 2 | $8 . S P .2$ |
| 4 | B | 3 | $8 . E E .8 . b$ |
| 5 | NA | 1 | $8 . F .3$ |
| 6 | NA | 2 | $8 . G .9$ |
| 7 | NA | 3 | $8 . E E .6$ |
| 8 | 2 | $8 . E E .8 . b$ |  |

*DOK is the abbreviation for Depth of Knowledge. Please note that DOK is associated to the complexity level of an assessment item and is not aligned to the standard. Further information regarding DOK can be accessed on the Kentucky Department of Education Web site: http://education.ky.gov/curriculum/docs/Pages/Content-Specific-Core-Content-for-Assessment-DOK-Support-Materials.aspx
**Further information regarding Common Core Standards can be accessed on the Common Core Web site:
http://www.corestandards.org

