Released Test Answer and Alignment Document
Mathematics – Algebra 2
Spring 2018

Item Number	Answer Key	Evidence Statement Key
1.	A, B, E	A-APR.2
2.	6	A-REI.2
3.	D	A-SSE.3c-2
4.	Part A: D Part B: C	F-IF.4-2
5.	D	N-CN.2
6.	A	A-SSE.2-3
7.	A, D, G	A-REI.11-2
8.	The solutions are [-1.5 ▼] and [1.5 ▼].	A-Int.1
9.	Part A: C Part B: A	F-Int.1-2
10.	Part A: See Rubric Part B: See Rubric	HS-D.CCR
11.	See Rubric	HS-C.17.3
12.	D	F-BF.3-2
13.	([-2] , [7])	A-REI.7
14.	Part A: See Rubric Part B: See Rubric	HS-C.CCR
15.	C	F-BF.1b-1
16.	D	N-CN.7
17.	B	N-RN.2
18.	Part A: C Part B: C	F-LE.2-3

	#10 Rubric Part A VH145748
Score	**Description**
4	Student response includes the following 4 elements. • Valid definition of variables • Valid model of the rental costs for Company X • Valid model of the rental costs for Company Y • Correct number of miles when the rental costs of the two trucks will be equal Sample Student Response: Let m represent the number of miles. Let C_x represent the cost, in dollars, of renting a truck from Company X and C_y represent the cost, in dollars, of renting a truck from Company Y. Rental costs for the truck from Company X: $C_x = (29.95 + 18)(2) + 150 + 0.59m$ $= 47.95(2) + 150 + 0.59m$ $= 95.90 + 150 + 0.59m$ $= 245.90 + 0.59m$ Rental costs for the truck from Company Y: $C_x = (19.95 + 26)(2) + 0.79m$ $= 45.95(2) + 0.79m$ $= 91.90 + 0.79m$ To determine when the rental costs will be equal, set $C_x=C_y.$ $245.9 + 0.59m = 91.90 + 0.79m$ $245.9 - 91.9 = 0.79m - 0.59m$ $0.2m = 154$ $m = 770$ The number of miles for which the costs are the same for the two companies is 770 miles.
3	Student response includes 3 of the 4 elements.
2	Student response includes 2 of the 4 elements.
1	Student response includes 1 of the 4 elements.
0	Student response is incorrect or irrelevant.

#10 Rubric Part B VH145748	
Score	**Description**
2	Student response includes the following 2 elements. • Valid calculation for renting each truck • Valid conclusion with supported reasoning Sample Student Response: Company X at 750 miles. Rental cost is 245.90 + 0.59(750) = \$688.40. Gasoline cost is $\left(\dfrac{750}{10}\right)(3.50) = \$262.50$. Total cost is \$950.90 Company Y at 750 miles. Rental cost is 91.90 + 0.79(750) = \$684.40. Gasoline cost is $\left(\dfrac{750}{7}\right)(3.50) = \$375$. Total cost is \$1,059.40. The family should rent the truck from Company X because the total cost will be lower. Based on the family's estimated mileage and the cost of gasoline, the total cost of renting the truck from Company X will be \$950.90 whereas the total cost of renting the truck from Company Y will be \$1,059.40.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#11 Rubric M43214	
Score	**Description**

3	Student response includes the following 3 elements.
	
	• **Reasoning component =** 3 points
	   o Valid explanation of why this situation is an observational study
	   o Valid explanation why the principal's randomization process may not give accurate data

| | o Valid explanation of how the principal's randomization process could be improved and how the improvements would give more accurate data

Sample Student Response:

The situation is an observational study because the researcher is monitoring individuals and is not attempting to influence the individuals or give them a treatment. The randomization may not give accurate data because the first 40 students to arrive at school may live closest to the school (or some other contributing factor). The principal's randomization process can be improved by randomly selecting students from the school once all students have arrived for the day. For example, the principal could randomly select 10 students from each grade using student ID numbers. This would give the principal better information because the sample is more likely to be a better representation of all students than just selecting the first 40 students who arrive at school.

(Or other valid randomization method.) |
2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

#14 Rubric Part A VH147862	
Score	**Description**
1	Student response includes the following element.

• **Reasoning component** = 1 point
  o Valid explanation for the meaning of 1 - p.

Sample Student Response:

1 – p is the proportion of the element remaining after 1 hour.

Note: The student earns the point if he or she uses decay factor or another valid term instead of proportion. |
| **0** | Student response is incorrect or irrelevant. |

Score	Description
	#14 Rubric Part B **VH147862**

3	Student response includes the following 3 elements.
	
	• **Reasoning component** = 3 point
	  ○ Valid model to determine the amount remaining after a given amount of time
	  ○ Valid work to determine t
	  ○ Correct answer for the length of time it takes for 1 gram to remain is determined
	
	Sample Student Response:
	
	As there is 36% of the original amount after 2 hours, this means that:
	
	$0.36A_0 = A_0(1 - p)^2$
	
	$0.36 = (1 - p)^2$
	
	$0.6 = (1 - p)$
	
	$A(t) = A_0(0.6)^t$
	
	By setting $A(t) = 1$, and $A_0 = 100$, t can be determined using the equation $1 = 100(0.6)^t$. Graphing both $y_1 = 1$, and $y_2 = 100(0.6)^t$, the intersection occurs at $t \approx 9.015$. It will take about 9 hours for only 1 gram of the element to remain.

2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.