SELECTED SOLUTIONS AND COMMENTS FOR TASKS
Grade 8 – Algebra and Statistics

Tasks are intended to serve different purposes. When appropriate, students are encouraged to make choices, think strategically, and explain their reasoning. This document contains answers to selected problems. When answers vary, we try to offer an example when possible. When not possible, we describe what a student response could look like. The solutions in this document are not meant to represent an exhaustive list of suitable answers.

Equation Exploration (equations)	
1	Answers will vary. As an example: $2x + 3 = x - 2$
2	Answers will vary. As an example: $2(x + 7) = -5(3 + x)$
3	Answers will vary. As an example: $3.2x = 4 + \frac{3}{2}x$
4	Answers will vary. As an example: $3.2(x + 5) = \frac{3}{2}(x - 4)$
5	Answers will vary. As an example: $3x + 1 = 3x - 2$
6	Answers will vary. As an example: $3(x + 1) = 3x + 3$
7	No solutions.
8	Infinitely many solutions.
9	$w = -\frac{11}{5}$
10	$w = 0$

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<table>
<tr><th colspan="4">Functional Relationship? (functions)</th></tr>
<tr><td>2</td><td colspan="3">1-800-284-5348</td></tr>
<tr><td>3</td><td colspan="3">“GOOD” → 4663
“HOME” → 4663
Check to see they accurately translated their names.

Every word does not have a unique number pattern. GOOD and HOME are two words with the same number pattern.</td></tr>
<tr><td>4</td><td>Digit (Input)
1 →
2 →
3 →
4 →
5 →
6 →
7 →
8 →
9 →
0 →</td><td>Letters (Output)
None
A, B, C
D, E, F
G, H, I
J, K, L
M, N, O
P, Q, R, S
T, U, V
W, X, Y, Z
None</td><td>Note: Some phones show Q and Z; some phones don’t.</td></tr>
<tr><td>5</td><td>Letters (Input)
A →
B →
C →
D →
E →
F →
G →
H →
I →
J →
K →
L →
M →
N →
O →
P →
Q →
R →
S →
T →
U →
V →
W →
X →
Y →
Z →</td><td>Digits (Output)
2
2
2
3
3
3
4
4
4
5
5
5
6
6
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7
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7
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8
8
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9
9</td><td>Note: Some phones show Q and Z; some phones don’t.</td></tr>
<tr><td>6</td><td colspan="3">Answers will vary. MEAT and NEAT are two examples.</td></tr>
<tr><td>7</td><td colspan="3">The mapping diagram in Problem 5 represents a function because every input has exactly one output. The mapping diagram in Problem 4 does not represent a function because the inputs 0 and 1 do not have an output and all the other numbers have more than one output.</td></tr>
</table>

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Describing and Drawing Graphs (functions)	
1	Answers will vary. As an example: Billy turns on a faucet and water pours into an empty sink with the drain plugged. He turns off the faucet and does some dishes. Then he turns on the faucet to add more water so he can wash a large cooking pot. Then he turns off the faucet and washes the large cooking pot. After that, he's done with the dishes and pulls the plug and the water goes down the drain until the sink is empty again.
2	Answers will vary. Many students will want to graph height on the vertical axis. In general: An increase in speed should be represented by positive slope. A decrease in speed should be represented by a negative slope. A constant speed should be represented by a flat line with a slope of zero. Section A should show a line or a curve with a positive slope since the speed is increasing. Section B should show a line or a curve with a negative slope since the speed is decreasing. Section C should show a sharp increase in speed and a steep positive slope. Section D should show a "dip". As the rollercoaster goes up the loop it should slow down and as it comes down the other side, the speed should increase. Section E should be a flat line not on the *x*-axis (since that would represent a constant speed of 0). Section F should be a line with a negative slope that ends on the *x*-axis.

Staircase Slopes (linear functions - slope)	
1	The rise is the height of the riser. The run is the width of the tread.
2	Check answers and reasoning for accuracy.
3	Answers will vary. There should be a SEPARATE table for EACH staircase measured.
4	In general, the ratios of rise to run for each step in a staircase should be the same.
5	The value of the ratio represents the steepness of the staircase. In general, each staircase has a constant steepness (and therefore a constant slope). Some staircases are steeper than others and therefore the ratio (slope) may vary from staircase to staircase. Building codes heavily regulate the steepness of staircases.

Your Savings Problem (linear functions)	
	Answers will vary. Check answers for reasonableness and accuracy.

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Choosing a Gym Membership (linear functions – systems)	
	Answers may vary. If friend plans to go more than once a week, it is better to get the monthly plan. If friend plans to go for more than 6 months, it is better to get the annual plan.

Grades or Popularity (data)	
1a	Statement 2 should say "54% of the popular students are male."
1b	Statement 1 should say "42% of the females care about getting good grades."
2	Yes. There's a 62% chance they are male.
3	Not really. Table 1 shows a fairly even split.
4	Answers will vary.

Vitruvian Man (data)	
	Answers will vary. Check answers for reasonableness and accuracy.