SELECTED SOLUTIONS AND COMMENTS FOR TASKS
Grade 6 – Whole Numbers, Negative Numbers, Coordinate Graphing

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.

Multiplication Patterns (whole number multiplication)	
1	$37 \times 3 = 111$ $37 \times 6 = 222$ $37 \times 9 = 333$
2	Predictions and explanations will vary.
5	$37 \times \underline{12} = 444$ $37 \times \underline{27} = 999$
6	Descriptions will vary. The product of 37 and a multiple of 3 will result in a multiple of 111. That is, $37 \times 3n = 111n$ where n is a whole number.

Interpreting the Division Algorithm (whole number division)	
1	The student placed the 4 digit in the incorrect place value location in the quotient. The 4 should have been in the hundreds place, not the tens place. That would have allowed for the 0 to be placed in the tens place.
2	a. $189 \times 16 = 3024$ since there was no remainder. b. $80 \times 16 = 1280$ c. $9 \times 16 = 144$

The Locker Problem (whole number concepts)		
1		Students 1, 2, 4, 5, 10 and 20 change Locker #20.
2	**a**	2 students (namely 1 and 29)
	b	7 students (namely 1, 2, 3, 6, 9, 12, and 36)
	c	5 students (namely 1, 3, 9, 27, and 81)
	d	16 students (namely 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, and 120)
	e	24 students (namely 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 40, 45, 60, 72, 90, 120, 180, and 360)
3		Student 159 touches Lockers 159, 318, 477, 636, 795 and 954.
4		The square numbered lockers are all open at the end. That is 1, 4, 9, 16, 25, …

The Clock Problem (whole number concepts; prime numbers)	
	Answers may vary. One example includes, clockwise, starting from the 12 o'clock position: 12, 1, 2, 3, 4, 7, 10, 9, 8, 5, 6 and 11.

The Problem of 6s (order of operation)	
	Answers may vary.

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Grade 6 – whole numbers, negative numbers, coordinate graphing continued

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Base 2 (examining a different number system)

1. Sources will vary.
2. Base 2 uses the digits 0 and 1.
3. The place values are: 32, 16, 8, 4, 2, and 1.
4.

Base 10	Base 2		Base 10	Base 2		Base 10	Base 2
0	0		7	111		14	1110
1	1		8	1000		15	1111
2	10		9	1001		16	10000
3	11		10	1010		17	10001
4	100		11	1011		18	10010
5	101		12	1100		19	10011
6	110		13	1101		20	10100

5. 111111(base 2) is equal to 63 in base 10.
6.

Base 10	30	35	40	45	50	60
Base 2	11110	100011	101000	101101	110010	111100

7.

Base 2	10101	11001	101010	110011
Base 10	21	25	42	51

The Construction Project (integers/negative numbers)

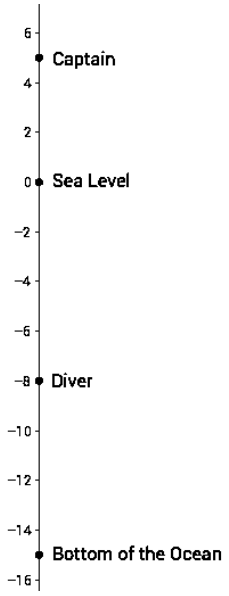
1. See the number line at the right. The locations under water are best described using negative numbers.

2. a) False; the diver is 7 feet from the bottom of the ocean and 8 feet from the surface.
   b) True
   c) True

3. Answers may vary.

4. The captain is 20 feet from the bottom of the ocean.
   The diver should be 5 feet under the water (10 feet from the bottom
   of the ocean).
   The control room is 7 feet above the deck of the boat, and at an
   elevation of 12 feet.

5. Answers may vary.



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Reading A Map (integers/negative numbers; coordinate graphing)	
1	Whoops, these two streets do not intersect. If the airport was at the corner of Woodley and Van Owen, the coordinates would be (-1,4).
2	(1,4)
3	(2,4)
4	Half a mile
5	One and one-half miles
6	Regardless of the path, the total distance will be the same if you always move in a south-east direction.
7	6.25 square miles
8	Answers may vary.
9	Answers may vary.