7th Grade Math Distance Learning Packet

Name_____ Per_____

In order to continue your development as an independent and mathematical learner please complete <u>one</u> “iM task” and <u>half</u> of a “fluency support” page each day.

This is important because your education matters and YOU MATTER!

Return this completed packet to your math teacher upon your return.

7.NS, 7.RP, 7.EE Drill Rig

Alignments to Content Standards: 7.NS.A.2 7.NS.A.3 7.RP.A 7.EE.B.4

Task

A water well drilling rig has dug to a height of –60 feet after one full day of continuous use.

a. Assuming the rig drilled at a constant rate, what was the height of the drill after 15 hours?

b. If the rig has been running constantly and is currently at a height of –143.6 feet, for how long has the rig been running?

7.RP Sale!

Alignments to Content Standards: 7.RP.A

Task

Four different stores are having a sale. The signs below show the discounts available at each of the four stores.

Two for the price of one	**Buy one and get 25% off the second**
Buy two and get 50% off the second one	**Three for the price of two**

a. Which of these four different offers gives the biggest price reduction? Explain your reasoning clearly.

b. Which of these four different offers gives the smallest price reduction? Explain your reasoning clearly.

7.RP Cider versus Juice - Variation 1

Alignments to Content Standards: 7.RP.A.1 7.RP.A.2.b

Task

The price of a gallon of apple cider is $7.00. The price of eight 4.23-ounce juice boxes is $2.39.

a. Suppose the juice was instead packaged like the cider. Approximately what is the cost per gallon of the juice?

b. Suppose the cider was instead packaged like the juice. Approximately what is the cost per eight 4.23-ounce boxes of cider?

c. Peter wants to have at least a gallon of either only cider or only juice. Which product is the better deal?

d. State the unit rate(s) you used to compare the cost of cider versus juice in your answer to Question c.

7.RP Gym Membership Plans

Alignments to Content Standards: 7.RP.A.2.a 7.RP.A.2.c

Task

In January, Georgia signed up for a membership at Anytime Fitness. The plan she chose cost $95 in start-up fees and then $20 per month starting in February. Edwin also signed up at Anytime Fitness in January. His plan cost $35 per month starting in February, and his start-up fees were waived.

a. Create tables for both Georgia and Edwin that compare the number of months since January to the total cost of their gym memberships. Continue this table for one year.

b. Plot the points from the two tables in part (a) on a coordinate plane.

c. Decide if either or both gym memberships are described by a proportional relationship, and write an equation representing any such relationship. Explain how parts (a) and (b) could be used to support your answer.

7.RP Chess Club

Alignments to Content Standards: 7.RP.A.3

Task

There were 24 boys and 20 girls in a chess club last year. This year the number of boys increased by 25% but the number of girls decreased by 10%. Was there an increase or decrease in overall membership? Find the overall percent change in membership of the club.

7.G,RP Measuring the area of a circle

Alignments to Content Standards: 7.G.B.4 7.RP.A.3

Task

Juan wants to know the cross-sectional area of a circular pipe. He measures the diameter which he finds, to the nearest millimeter, to be 5 centimeters.

a. How large is the possible error in Juan's measurement of the diameter of the circle? Explain.

b. As a percentage of the diameter, how large is the possible error in Juan's measurement?

c. To find the area of the circle, Juan uses the formula $A = \pi r^2$ where A is the area of the circle and r is its radius. He uses 3.14 for π. What value does Juan get for the area of the circle?

d. As a percentage, how large is the possible error in Juan's measurement for the area of the circle?

7.NS Differences of Integers

Alignments to Content Standards: 7.NS.A.1.c 7.NS.A.1.b 7.NS.A.1

Task

Ojos del Salado is the highest mountain in Chile, with a peak at about 6900 meters above sea level. The Atacama Trench, just off the coast of Peru and Chile, is about 8100 meters below sea level (at its lowest point).

a. What is the difference in elevations between Mount Ojos del Salado and the Atacama Trench?

b. Is the elevation halfway between the peak of Mount Ojos del Salado and the Atacama Trench above sea level or below sea level? Explain without calculating the exact value.

c. What elevation is halfway between the peak of Mount Ojos del Salado and the Atacama Trench?

Illustrative Mathematics

7.NS Distributive Property of Multiplication

Alignments to Content Standards: 7.NS.A.2.a

Task

Lucia uses the picture below to explain the distributive property for the expression $(3+1) \times (5+1)$:

a. Find $(3+1) \times (5+1)$ using the distributive property.

b. Explain how Lucia's picture relates to your calculation in (a).

c. How can Lucia use a picture to find $(3-1) \times (5-1)$ using the distributive property? Explain.

7.EE Who is the better batter?

Alignments to Content Standards: 7.EE.B.3

Task

Below is a table showing the number of hits and the number of times at bat for two Major League Baseball players during two different seasons:

Season	Derek Jeter	David Justice
1995	12 hits in 48 at bats	104 hits in 411 at bats
1996	183 hits in 582 at bats	45 hits in 140 at bats

A player's *batting average* is the fraction of times at bat when the player gets a hit.

a. For each season, find the players' batting averages. Who has the better batting average?

b. For the combined 1995 and 1996 seasons, find the players' batting averages. Who has the better batting average?

c. Are the answers to (a) and (b) consistent? Explain.

7.EE Sports Equipment Set

Alignments to Content Standards: 7.EE.B.4.b

Task

Jonathan wants to save up enough money so that he can buy a new sports equipment set that includes a football, baseball, soccer ball, and basketball. This complete boxed set costs $50. Jonathan has $15 he saved from his birthday. In order to make more money, he plans to wash neighbors' windows. He plans to charge $3 for each window he washes, and any extra money he makes beyond $50 he can use to buy the additional accessories that go with the sports box set.

Write and solve an inequality that represents the number of windows Jonathan can wash in order to save at least the minimum amount he needs to buy the boxed set. Graph the solutions on the number line. What is a realistic number of windows for Jonathan to wash? How would that be reflected in the graph?

7.SP Election Poll, Variation 1

Alignments to Content Standards: 7.SP.A

Task

Members of the seventh grade math group have nominated a member of their group to be class president. Every student in seventh grade will cast a vote. There are 2 candidates in the race and a candidate needs at least 50% of the votes to be elected. The math group wants to conduct a survey to assess their candidate's prospects. There are almost 500 students in the seventh grade at their school. They do not have the resources to interview all seventh graders so they have decided to interview a sample of 40 seventh graders. They will obtain the seventh grade list of names from their school principal's office and select the sample from this list. They plan to ask each student in the sample whether they plan to vote for their candidate or the other candidate.

a. How should the students select the sample of 40 to have the best chance of obtaining a representative sample? Describe clearly how they could use the random number table provided below to select the sample of 40 students. "Clearly" means that someone other than you could duplicate the sampling process by following your description.

Random Number Table Generated in Excel

196	14	57	441	219
459	284	356	306	119
358	241	406	122	390
238	98	392	433	256
335	189	24	260	452
468	106	28	294	46
20	385	37	109	4
437	70	464	471	432
454	474	1	280	117
492	390	154	115	336
460	377	101	312	350
115	126	64	333	291
445	297	449	171	234
438	224	357	13	500
288	284	254	86	173
449	340	11	9	387
359	133	494	31	458
217	174	343	3	350
171	195	127	141	276
299	246	394	164	294

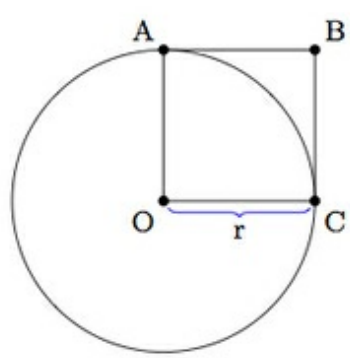
b. Suppose that all 40 students selected from the list of seventh graders in the school respond to the survey, and the results showed that 18 students would vote for the math group's candidate. In order to get elected, a candidate must receive at least 50% of the votes. Some members of the math group believe that on the basis of this sample outcome it is unreasonable to think that their candidate can win. Others in the group believe that it is possible that their candidate might win. Based on the initial survey results, should the math group students be discouraged, or is it reasonable to think their candidate might win? Justify your response statistically.

7.G Approximating the area of a circle

Alignments to Content Standards: 7.G.A.1 7.G.B.4

Task

Below is a picture of a circle of radius r and a square of side length r:



a. Show that

$$2 \leq \frac{\text{Area(Circle)}}{\text{Area(Square)}} \leq 4.$$

b. How can we find a more accurate estimate of $\frac{\text{Area(Circle)}}{\text{Area(Square)}}$ than the one in part (a)?

c. Explain why the quotient $\frac{\text{Area(Circle)}}{\text{Area(Square)}}$ does not depend on the radius r.

7.G Circumference of a Circle

Alignments to Content Standards: 7.G.A.1 7.G.B.4

Task

a. Draw circles with diameters as indicated below and measure their circumferences to complete the following table.

Diameter of Circle (inches)	Circumference of Circle (inches)	$\frac{\text{Circumference of Circle}}{\text{Diameter of Circle}}$
1		
2		
3		
$\frac{1}{2}$		

b. The number π can be defined as the circumference of a circle with diameter 1 (unit). Using your knowledge about circles (that is, *without measuring*), complete the following table. Explain how you know the circumferences of the different circles.

Diameter of Circle (inches)	Circumference of Circle (inches)	$\frac{\text{Circumference of Circle}}{\text{Diameter of Circle}}$
1	π	π
2		
3		

$\frac{1}{2}$		

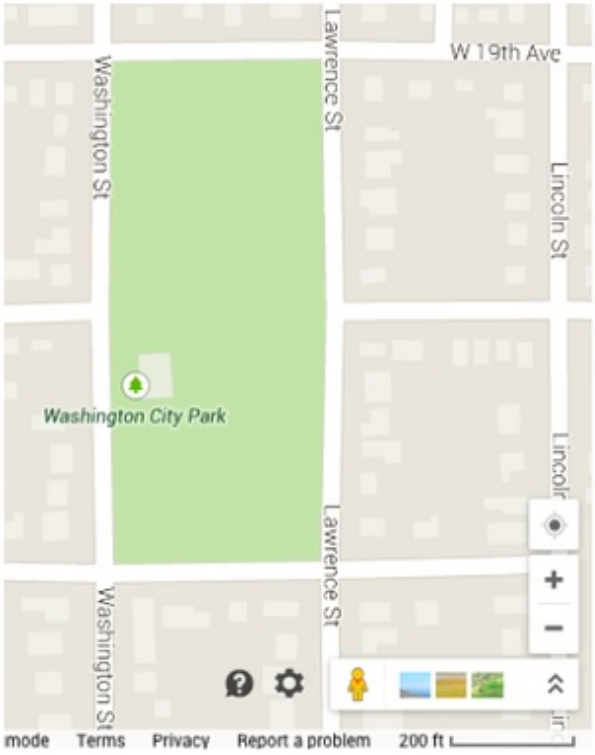
c. How does the information in the two tables compare? Explain.

7.G Rescaling Washington Park

Alignments to Content Standards: 7.G.A.1

Task

Your computer shows you a map of Washington Park in Eugene, Oregon. The scale in the bottom right corner of the map tells us that the length of the bar represents 200 feet on the map.



Clicking a resizing button on the computer screen will result in an image of Washington Park where the exact same-sized bar now represents 150 feet.

a. Do you think the size of Washington Park under the 150 ft scale will appear smaller or larger than it was under the 200 ft scale?

b. Draw an accurate picture/map of Washington Park under this new 150 ft scale.

c. Was your guess in part a correct? Can you explain why the size of the map changed as it did?

Number Correct: _____
Improvement: _____

Sprint Title – Round 2

Directions: Evaluate each expression. Place the final answer in the last column in each section

1.	12 ones ÷ 2 ones	
2.	12 ÷ 2	
3.	12 tens ÷ 2 tens	
4.	120 ÷ 20	
5.	12 hundreds ÷ 2 hundreds	
6.	1,200 ÷ 200	
7.	12 halves ÷ 2 halves	
8.	$\frac{12}{2} \div \frac{2}{2}$	
9.	12 fourths ÷ 3 fourths	
10.	$\frac{12}{4} \div \frac{3}{4}$	
11.	$\frac{12}{8} \div \frac{3}{8}$	
12.	$\frac{2}{4} \div \frac{1}{4}$	
13.	$\frac{1}{4} \div \frac{2}{4}$	
14.	$\frac{4}{5} \div \frac{2}{5}$	
15.	$\frac{2}{5} \div \frac{4}{5}$	
16.	$\frac{3}{5} \div \frac{4}{5}$	
17.	$\frac{6}{8} \div \frac{2}{8}$	
18.	$\frac{6}{8} \div \frac{4}{8}$	
19.	$\frac{6}{8} \div \frac{5}{8}$	
20.	$\frac{6}{10} \div \frac{2}{10}$	
21.	$\frac{7}{10} \div \frac{8}{10}$	
22.	$\frac{4}{10} \div \frac{7}{10}$	

23.	$\frac{6}{12} \div \frac{4}{12}$	
24.	$\frac{6}{12} \div \frac{2}{6} = \frac{6}{12} \div \frac{\quad}{12}$	
25.	$\frac{8}{14} \div \frac{7}{14}$	
26.	$\frac{8}{14} \div \frac{1}{2} = \frac{8}{14} \div \frac{\quad}{14}$	
27.	$\frac{11}{14} \div \frac{2}{14}$	
28.	$\frac{11}{14} \div \frac{1}{7} = \frac{11}{14} \div \frac{\quad}{14}$	
29.	$\frac{1}{7} \div \frac{6}{14} = \frac{\quad}{14} \div \frac{6}{14}$	
30.	$\frac{7}{18} \div \frac{3}{18}$	
31.	$\frac{7}{18} \div \frac{1}{6} = \frac{7}{18} \div \frac{\quad}{18}$	
32.	$\frac{1}{3} \div \frac{12}{18} = \frac{\quad}{18} \div \frac{12}{18}$	
33.	$\frac{1}{6} \div \frac{4}{18}$	
34.	$\frac{4}{12} \div \frac{8}{6}$	
35.	$\frac{1}{3} \div \frac{3}{15}$	
36.	$\frac{2}{6} \div \frac{1}{9} = \frac{\quad}{18} \div \frac{\quad}{18}$	
37.	$\frac{1}{6} \div \frac{4}{9}$	
38.	$\frac{2}{3} \div \frac{3}{4}$	
39.	$\frac{1}{3} \div \frac{3}{5}$	
40.	$\frac{1}{7} \div \frac{1}{2}$	
41.	$\frac{5}{6} \div \frac{2}{9}$	
42.	$\frac{5}{9} \div \frac{2}{6}$	
43.	$\frac{5}{6} \div \frac{4}{9}$	
44.	$\frac{1}{2} \div \frac{4}{5}$	

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Number Correct: _____
Improvement: _____

Subtraction of Decimals – Round 2

Directions: Evaluate each expression.

1.	$66 - 60$	
2.	$66 - 6$	
3.	$6.6 - 6$	
4.	$6.6 - 0.6$	
5.	$99 - 90$	
6.	$99 - 9$	
7.	$9.9 - 9$	
8.	$9.9 - 0.9$	
9.	$22 - 20$	
10.	$22 - 2$	
11.	$2.2 - 2$	
12.	$3 - 0.4$	
13.	$3 - 0.04$	
14.	$3 - 0.004$	
15.	$0.3 - 0.04$	
16.	$8 - 0.2$	
17.	$8 - 0.02$	
18.	$8 - 0.002$	
19.	$0.8 - 0.02$	
20.	$5 - 0.1$	
21.	$5 - 0.01$	
22.	$5 - 0.001$	

23.	$6.8 - 4$	
24.	$6.8 - 0.4$	
25.	$0.68 - 0.4$	
26.	$0.68 - 0.04$	
27.	$7.3 - 1$	
28.	$7.3 - 0.1$	
29.	$0.73 - 0.1$	
30.	$0.73 - 0.01$	
31.	$9.5 - 2$	
32.	$9.5 - 0.2$	
33.	$0.95 - 0.2$	
34.	$8.3 - 5$	
35.	$8.3 - 0.5$	
36.	$0.83 - 0.5$	
37.	$0.83 - 0.05$	
38.	$7.2 - 4$	
39.	$7.2 - 0.4$	
40.	$0.72 - 0.4$	
41.	$0.72 - 0.04$	
42.	$9.3 - 7$	
43.	$9.3 - 0.7$	
44.	$0.93 - 0.7$	

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Number Correct: _____
Improvement: _____

Multiplication of Decimals – Round 2

Directions: Evaluate each expression.

1.	9×1	
2.	0.9×1	
3.	0.09×1	
4.	0.009×1	
5.	2×2	
6.	2×0.2	
7.	2×0.02	
8.	2×0.002	
9.	3×2	
10.	0.3×2	
11.	0.03×2	
12.	0.7×0.1	
13.	0.07×0.1	
14.	0.7×0.01	
15.	0.07×0.01	
16.	0.2×0.4	
17.	0.02×0.4	
18.	0.2×0.04	
19.	0.02×0.04	
20.	0.1×0.1	
21.	0.01×0.1	
22.	0.1×0.01	

23.	3×4	
24.	3×0.4	
25.	0.3×4	
26.	0.3×0.4	
27.	7×7	
28.	7×0.7	
29.	0.7×7	
30.	0.7×0.7	
31.	2×8	
32.	2×0.8	
33.	0.2×0.8	
34.	0.6×0.5	
35.	0.6×0.05	
36.	0.6×0.005	
37.	0.06×0.005	
38.	0.9×0.9	
39.	0.09×0.9	
40.	0.009×0.9	
41.	0.009×0.09	
42.	1.1×0.5	
43.	1.1×0.05	
44.	1.1×0.005	

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Number Correct: _____

Integer Subtraction—Round 1

Directions: Determine the difference of the integers, and write it in the column to the right.

1.	$4 - 2$	
2.	$4 - 3$	
3.	$4 - 4$	
4.	$4 - 5$	
5.	$4 - 6$	
6.	$4 - 9$	
7.	$4 - 10$	
8.	$4 - 20$	
9.	$4 - 80$	
10.	$4 - 100$	
11.	$4 - (-1)$	
12.	$4 - (-2)$	
13.	$4 - (-3)$	
14.	$4 - (-7)$	
15.	$4 - (-17)$	
16.	$4 - (-27)$	
17.	$4 - (-127)$	
18.	$14 - (-6)$	
19.	$23 - (-8)$	
20.	$8 - (-23)$	
21.	$51 - (-3)$	
22.	$48 - (-5)$	

23.	$(-6) - 5$	
24.	$(-6) - 7$	
25.	$(-6) - 9$	
26.	$(-14) - 9$	
27.	$(-25) - 9$	
28.	$(-12) - 12$	
29.	$(-26) - 26$	
30.	$(-13) - 21$	
31.	$(-25) - 75$	
32.	$(-411) - 811$	
33.	$(-234) - 543$	
34.	$(-3) - (-1)$	
35.	$(-3) - (-2)$	
36.	$(-3) - (-3)$	
37.	$(-3) - (-4)$	
38.	$(-3) - (-8)$	
39.	$(-30) - (-45)$	
40.	$(-27) - (-13)$	
41.	$(-13) - (-27)$	
42.	$(-4) - (-3)$	
43.	$(-3) - (-4)$	
44.	$(-1{,}066) - (-34)$	

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Number Correct: _____
Improvement: _____

Integer Subtraction—Round 2

Directions: Determine the difference of the integers, and write it in the column to the right.

1.	$3 - 2$	
2.	$3 - 3$	
3.	$3 - 4$	
4.	$3 - 5$	
5.	$3 - 6$	
6.	$3 - 9$	
7.	$3 - 10$	
8.	$3 - 20$	
9.	$3 - 80$	
10.	$3 - 100$	
11.	$3 - (-1)$	
12.	$3 - (-2)$	
13.	$3 - (-3)$	
14.	$3 - (-7)$	
15.	$3 - (-17)$	
16.	$3 - (-27)$	
17.	$3 - (-127)$	
18.	$13 - (-6)$	
19.	$24 - (-8)$	
20.	$5 - (-23)$	
21.	$61 - (-3)$	
22.	$58 - (-5)$	

23.	$(-8) - 5$	
24.	$(-8) - 7$	
25.	$(-8) - 9$	
26.	$(-15) - 9$	
27.	$(-35) - 9$	
28.	$(-22) - 22$	
29.	$(-27) - 27$	
30.	$(-14) - 21$	
31.	$(-22) - 72$	
32.	$(-311) - 611$	
33.	$(-345) - 654$	
34.	$(-2) - (-1)$	
35.	$(-2) - (-2)$	
36.	$(-2) - (-3)$	
37.	$(-2) - (-4)$	
38.	$(-2) - (-8)$	
39.	$(-20) - (-45)$	
40.	$(-24) - (-13)$	
41.	$(-13) - (-24)$	
42.	$(-5) - (-3)$	
43.	$(-3) - (-5)$	
44.	$(-1{,}034) - (-31)$	

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Number Correct: _____

Generating Equivalent Expressions—Round 1

Directions: Write each as an equivalent expression in standard form as quickly and accurately as possible within the allotted time.

1.	$1+1$	
2.	$1+1+1$	
3.	$(1+1)+1$	
4.	$(1+1)+(1+1)$	
5.	$(1+1)+(1+1+1)$	
6.	$x+x$	
7.	$x+x+x$	
8.	$(x+x)+x$	
9.	$(x+x)+(x+x)$	
10.	$(x+x)+(x+x+x)$	
11.	$(x+x+x)+(x+x+x)$	
12.	$2x+x$	
13.	$3x+x$	
14.	$4x+x$	
15.	$7x+x$	
16.	$7x+2x$	
17.	$7x+3x$	
18.	$10x-x$	
19.	$10x-5x$	
20.	$10x-10x$	
21.	$10x-11x$	
22.	$10x-12x$	

23.	$4x+6x-12x$	
24.	$4x-6x+4x$	
25.	$7x-2x+3$	
26.	$(4x+3)+x$	
27.	$(4x+3)+2x$	
28.	$(4x+3)+3x$	
29.	$(4x+3)+5x$	
30.	$(4x+3)+6x$	
31.	$(11x+2)-2$	
32.	$(11x+2)-3$	
33.	$(11x+2)-4$	
34.	$(11x+2)-7$	
35.	$(3x-9)+(3x+5)$	
36.	$(11-5x)+(4x+2)$	
37.	$(2x+3y)+(4x+y)$	
38.	$(5x+1.3y)+(2.9x-0.6y)$	
39.	$(2.6x-4.8y)+(6.5x-1.1y)$	
40.	$\left(\frac{3}{4}x-\frac{1}{2}y\right)+\left(-\frac{7}{4}x-\frac{5}{2}y\right)$	
41.	$\left(-\frac{2}{5}x-\frac{7}{9}y\right)+\left(-\frac{7}{10}x-\frac{2}{3}y\right)$	
42.	$\left(\frac{1}{2}x-\frac{1}{4}y\right)+\left(-\frac{3}{5}x+\frac{5}{6}x\right)$	
43.	$\left(1.2x-\frac{3}{4}y\right)-\left(-\frac{3}{5}x+2.25x\right)$	
44.	$(3.375x-8.9y)-\left(-7\frac{5}{8}x-5\frac{2}{5}y\right)$	

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