SOL HW 1.1

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Math 8 Honours Assignment 1.1 Multiplication Strategies:

1. Multiply each of the following without a calculator. Try to use the strategies used in class:

a) 13×7 $10 \quad 3$ $7 \quad 70 \quad 21$ $= 91$	b) 21×8 $20 \times 8 + 8$ $= 168$	c) 18×9 $(18 \times 10) - 18$ $= 162$	d) 24×7 $(20 \times 7) + (4 \times 7)$ $= 140 + 28$ $= 168$	e) 91×3 $(90 \times 3) + 3$ $= 270 + 3$ $= 27$	f) 17×15 $(20 \times 15) - (3 \times 15)$ $= 300 - 45$ $= 255$
g) 33×7 $(30 \times 7) + (3 \times 7)$ $= 210 + 21$ $= 231$	h) 13×11 13 $13\times$ 143	i) 17×9 $170 - 17$ $= 153$	j) 35×8 $(30 \times 8) + (5 \times 8)$ $= 240 + 40$ $= 280$	k) 45×9 $(40 \times 9) + (5 \times 9)$ $= 360 + 45$ 405	l) 41×8 $(40 \times 8) + (1 \times 8)$ $= 320 + 8$ $= 328$
m) 23×6 $(20 \times 6) + (3 \times 6)$ $= 120 + 18$ $= 138$	n) 14×16 $(15-1)(15+1)$ $= 15^2 - 1$ $= 225 - 1$ $= 224$	o) 45×45 45×45 $= (4 \times 5)\,25$ $= 2025$	p) 75×75 $(70 \times 80) + 5^2$ $= 5600 + 25$ $= 5625$	q) 95×95 $= (95-5)(95+5) + 25$ $= (90)(100) + 25$ $= 9025$	r) 115×115 $(115+5)(115-5) + 25$ $= (120)(110) + 25$ $= 13225$
s) 55×65 $(60-5)(60+5)$ $= 60^2 - 5^2$ $= 3600 - 25$ $= 3575$	t) 75×65 $(70+5)(70-5)$ $= 70^2 - 25$ $= 4900 - 25$ $= 4875$	u) 85×65 $(75+10)(75-10)$ $= 75^2 - 10^2$ $= 5625 - 100$ $= 5525$	v) 95×35 $(65+30)(65-30)$ $65^2 - 30^2$ $= 4225 - 900$ $= 3325$	w) 45×85 $(65-20)(65+20)$ $= 65^2 - 20^2$ $= 4225 - 400$ $= 3825$	x) 27×33 $(30-3)(30+3)$ $= 30^2 - 3^2$ $= 900 - 9$ $= 891$
y) 19×21 $(20-1)(20+1)$ $= 400 - 1$ $= 399$	z) 35×45 $(40-5)(40+5)$ $= 40^2 - 25$ $= 1600 - 25$ $= 1575$	A) 81×79 $(80+1)(80-1)$ $6400 - 1$ $= 6399$	B) 16×24 $(20-4)(20+4)$ $400 - 16$ $= 384$	C) 23×27 $25^2 - 2^2$ $= 625 - 4$ $= 621$	D) 24×16 $= 384$
E) 59×51 $55^2 - 4^2$ $= 3025 - 16$ $= 3009$	F) 45×55 $50^2 - 5^2$ $2500 - 25$ $= 2475$	G) 11×17 17 17 187	H) 83×77 $80^2 - 3^2$ $6400 - 9$ $= 6391$	I) 64×66 $65^2 - 1$ $4225 - 1$ 4224	J) 72×68 $70^2 - 2^2$ $= 4900 - 4$ $= 4896$
K) 99×99 $99^2 = (99+1)(99-1) + 1^2$ $= 9800 + 1$ $= 9801$	L) 81×81 81 81 $1\,81$ $648\times$ 6561	M) 93×93 $93^2 = (93+7)(93-7) + 7^2$ $= (100)(86) + 49$ $= 8649$	N) 73×73	O) 44×99	P) 57×999
Q) 62×38	R) 43×77	S) 26×26	T) 123×999	U) 123×9999	V) 125×35

2. If $a \times 23 \times b = 6210$ and $a + b = N$, what is the smallest possible value of N?

3. What is the value of "K" such that the expression is true:
   a. $44 \times 25 = 100 \times K$
   b. $10 \times 20 \times 30 \times 40 \times 50 = 100 \times 2 \times 300 \times 4 \times K$

4. What is the value of each expression:
   a. $\left(2^3\right)^2 - 4^3$
   b. $1000^2 - 999^2$
   c. $501^2 - 499^2$
   d. $355^2 - 145^2$

5. If $800760 = 8 \times 10^x + 7 \times 10^y + 6 \times 10^z$, then what is the value of $x + y + z$?

6. For each statement, describe a situation in which the statement is true.
   a. The product of two integers equals one of the integers.

b. The product of two integers equals the opposite of one of the integers.

c. The product of two integers is less than both integers.

d. The product of two integers is greater than both integers.

7. One day a sales person talked to 16 customers in 1 hour. How long would he need to work if he wanted to talk to 112 customers?

8. Gaston withdrew $26 from his bank account each week for 17 weeks. Use integers to find the total amount Gaston withdrew over the 17 weeks. Show your work.

9. Since sunset 6 h ago, the temperature in Brandon, Manitoba, has decreased from +1 °C to -11 °C. Predict what the temperature will be 3 h from now. What assumptions did you make?

10. The only possible values of x are 3, 6, 9, and 12. The only possible values of y are -10, -8, -6, and -4. What is the largest and smallest value of $x \times y$?

11. The mean daily high temperature in Rankin Inlet, Nunavut, during one week in January was -20 °C. What might the temperatures have been on each day of the week? How many different possible answers can you find? Explain.

12. The mean of a group of six numbers is 40. The number 12 is removed from the group, what is the new mean?

13. In the computation shown, X, Y, Z represent a different digit respectively. Determine the value of X.

$$\begin{array}{r} X\,Y \\ \times\quad Z\,6 \\ \hline 3\,1\,2 \\ 3\,1\,2 \\ \hline 3\,4\,3\,2 \end{array}$$

14. The prime number 1999 can be written as $a^2 - b^2$. Given that $a^2 - b^2 = (a+b)(a-b)$, what is the value of $a^2 + b^2$?

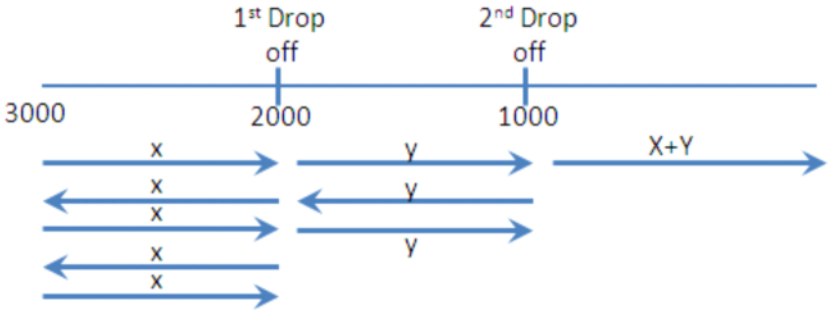
15. The product of 119 integers is negative. At most, how many of those numbers must be negative? Explain your answer in words.

16. There are four positive numbers, a, b, c, and d (not necessarily integers). Obviously there are six ways to multiply pairs of them: ab, ac, ad, bc, bd, and cd. If I tell you that five of the six pairs of products are 2, 3, 4, 5, and 6, what is the product of the last pair.

17. Challenge: A farmer grows 3000 bananas, and wants to take them to the market to sell. The market is 1000 miles away and the only way he can get there is by a hungry camel that can carry a maximum of 1000 bananas at a time. In addition, the camel needs to eat one banana to refuel for every mile that he walks. What is the maximum number of bananas that the farmer can successfully get all the way to the market?

Solution to the camel question:

1. Here's the objective towards maximizing the number of bananas. You always want to make sure that the camel is carrying the maximum load when it starts. Ie: You don't want the camel to start off carrying a fraction of the load. So having said this, you want to pick two location to drop off the bananas, so that when the camel comes back to it the last time, it will leave with 1000 bananas.



So now lets find "x" and "y"

$3000-5x=2000$ $2000-3x=1000$

$5x=1000$ $3x=1000$

$x=200$ $x=333.33333$

So what's left is $x+y=533.333$