

Name: Key

Period: _____

1-21. Copy these Diamond Problems and use the pattern you discovered earlier, shown at right, to complete each of them. Some of these may be challenging!



a. $6 \cdot 11$
 $\begin{array}{c} 66 \\ \swarrow \quad \searrow \\ 6 \quad 11 \\ \nwarrow \quad \nearrow \\ 17 \end{array}$ $6+11$

b. $-1 \cdot 4$
 $\begin{array}{c} -4 \\ \swarrow \quad \searrow \\ -1 \quad 4 \\ \nwarrow \quad \nearrow \\ 3 \end{array}$ $-1+4$

c. $\frac{6}{-2}$
 $\begin{array}{c} 6 \\ \swarrow \quad \searrow \\ -3 \quad -2 \\ \nwarrow \quad \nearrow \\ -5 \end{array}$ $-3+2$

d. $8 \cdot -1 = -8$
 $\begin{array}{c} -8 \\ \swarrow \quad \searrow \\ 8 \quad -1 \\ \nwarrow \quad \nearrow \\ 7 \end{array}$ $8+1=7$

e. $\frac{1}{2} \cdot \frac{1}{2}$
 $\begin{array}{c} \frac{1}{4} \\ \swarrow \quad \searrow \\ \frac{1}{2} \quad \frac{1}{2} \\ \nwarrow \quad \nearrow \\ 1 \end{array}$ $\frac{1}{2} + \frac{1}{2}$

f. $\frac{1}{3} \cdot \frac{3}{4} = \frac{1 \cdot 1}{3 \cdot 4}$
 $\begin{array}{c} \frac{1}{12} \\ \swarrow \quad \searrow \\ \frac{1}{3} \quad \frac{3}{4} \\ \nwarrow \quad \nearrow \\ \frac{13}{12} \end{array}$
 $\frac{1}{3} + \frac{3}{4} = \frac{4}{4} \cdot \frac{1}{3} + \frac{3}{4} \cdot \frac{3}{3} = \frac{4}{12} + \frac{9}{12}$

g. $x \cdot x$
 $\begin{array}{c} x^2 \\ \swarrow \quad \searrow \\ x \quad x \\ \nwarrow \quad \nearrow \\ 2x \end{array}$ $x+x$

h. $a \cdot b$
 $\begin{array}{c} ab \\ \swarrow \quad \searrow \\ a \quad b \\ \nwarrow \quad \nearrow \\ a+b \end{array}$

1-22. Compute without a calculator.

a. $-15 + 7$
 $\boxed{-8}$

b. $8 - (-21)$
 $8 + 21$
 $\boxed{29}$

c. $-12 - (-4)$
 $-12 + 4$
 $\boxed{-8}$

d. $-9 + (-13)$
 $\boxed{-22}$

e. $-50 - 30$
 $-50 + -30$
 $\boxed{-80}$

f. $3 - (-9)$
 $3 + 9$
 $\boxed{12}$

g. $-75 - (-75)$
 $-75 + 75$
 $\boxed{0}$

h. $(-3) + 6$
 $\boxed{3}$

i. $9 + (-14)$
 $9 - 14$
 $\boxed{-5}$

j. $28 - (-2)$
 $28 + 2$
 $\boxed{30}$

k. $-3 + (-2) + 5$
 $\underbrace{-3 + (-2)}_{-5} + 5$
 $-5 + 5$
 $\boxed{0}$

l. $3 + 2 + 5$
 $\underbrace{3 + 2}_{5} + 5$
 $5 + 5$
 $\boxed{10}$