

3.5 Mental Math and Estimation

Important Note: Estimation is an *approximate* answer to an arithmetic problem.

Some Mental Math Strategies:

1. Use commutativity/associativity/distributivity

ex. $13 + 21 + 45 + 39 + 27$

2. Additive/multiplicative compensation

ex. $98 + 47$

$64(5)$

3. Special factor

ex. $48(25)$

$84(5)$

4. Left-to-right addition

ex. $237 + 436$

Some Estimation Strategies:

1. Range estimate

ex. $196(23)$

2. Compatible number estimation

ex. $89(15)$

3. Rounding

ex. $2317 + 4341$

More examples:

1. $40 + 160 + 29 + 31$

2. $75 + 28$

3. $3679 - 474$

4. $5075 \div 25$

5. $123(3)$

6. $25 \times 32 \times 4$

7. Fliers are being delivered to 3625 houses and there are 42 people who will be doing the distribution. If distributed equally, about how many houses will each person visit?

Without computing, tell which of the following have the same answer.

(a) $88(44)$ and $44(22)$

(b) $93(15)$ and $31(45)$

(c) $12(18)$ and $20(17)$

Can you "estimate" by calculating the answer exactly and then rounding?

$$\begin{array}{r} 25 \\ +37 \\ \hline 62 \end{array}$$

See I know thirty
+ twenty = fifty
seven + five = 12
fifty + 12 = 62.

Student 1

$$\begin{array}{r} 25 \\ +37 \\ \hline 62 \end{array}$$

Student 2

$$\begin{array}{r} 25 \\ +37 \\ \hline 62 \end{array}$$

Student 3

$$\begin{array}{r} 25 \\ +37 \\ \hline 62 \end{array}$$

I added the
5 and the 7
together that
is 12 so I
carried the 1
and put down
the 2. 1 2 3 =
6. I put down
the 6 so it
62

Student 4

$$\begin{array}{r} 25 \\ +37 \\ \hline 53 \end{array}$$

2 + 3 = 5 and
5 + 7 = 12
so I had 5 12 I add
two to the one
and made 53

Student 5

$$\begin{array}{r} 25 \\ +37 \\ \hline 62 \end{array}$$

5 + 7 is 12
2 + 3 is 5
125
" "
" "

Student 6

What are they thinking?

$$\begin{array}{r} 23 \\ -15 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 562 \\ -237 \\ \hline 325 \end{array}$$

$$\begin{array}{r} 3562 \\ 287 \\ \hline 185 \end{array}$$

$$\begin{array}{r} 53 \\ \times 4 \\ \hline 212 \end{array}$$