

1. Use a block model to illustrate $145 - 68$.
2. Simplify $2^8 \cdot 2^{72}$
3. You are told that $143 + 432 = 1130$. What is going on ?
4. Using the fact that 98 is close to 100, describe how you could multiply $98 \cdot 42$ quickly. Explain why this works.
5. Describe a quick way of computing $63 - 47$ and explain why it works.
6. Explain how to estimate $63 + 173 + 41 + 189 + 30 + 12$. Why does the method work ?
7. Since $39 + 51 = 40 + 50$, why isn't $39 \cdot 51 = 40 \cdot 50$?
8. Explain how to use a (four function) calculator to find the remainder in division of integers.
9. Explain how a numberline model with a car handles $5 - 3$ and $7 - (-2)$.
10. Use patterns to show how to compute $7 + (-3)$.
11. Explain why multiplication by 5 can be done by dividing by 2 and then moving the decimal place.
12. Describe a quick way of calculating a fifteen percent tip. Show with examples how to estimate it and how to compute it exactly.
13. Factor $x^2 - 100$
14. Explain why the product of two negatives is positive. Give at least three different approaches.
15. For what values of the digit a is the integer $875147341379532a$ divisible by 3.
16. Show how to use the Sieve of Eratosthenes to find primes.
17. Suppose you want to test whether or not 397 is prime. At what point should you stop looking for factors ?
18. How many prime numbers are there ? Why are primes and factorings and related concepts important to the average person (without them knowing usually) ?
19. Use the Euclidean algorithm to find the g.c.d. of 8532 and 3876.
20. Find the l.c.m. of 12 and 32. Show it using lists of multiples.
21. Working modulo 12, compute $7 + 9 + 4 + 7 + 11$ and $8 \cdot 3$.
22. Review all the homework, all the quizzes, and your notes from class.