

First name: _____ Last name: _____ Student ID: _____

Operation and Calculation Homework**Basic problems****1. Round each number to the place value indicated.**

1. 21 tens	2. 85 tens	3. 1,478,729 millions	4. 59,787 thousands
5. 1,424,621 ten thousands	6. 248,699 hundreds	7. 212 hundreds	8. 9,029 tens

2. Write each expression in exponential form.

1. $12 \times 12 \times 12 \times 12$	2. $(5)(5)(5)(5)(5)$
3. $(8)(8)(8)(8)(8)(8)$	4. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
5. $11 \cdot 11$	6. $13 \times 13 \times 13$

3. Complete. Show work.

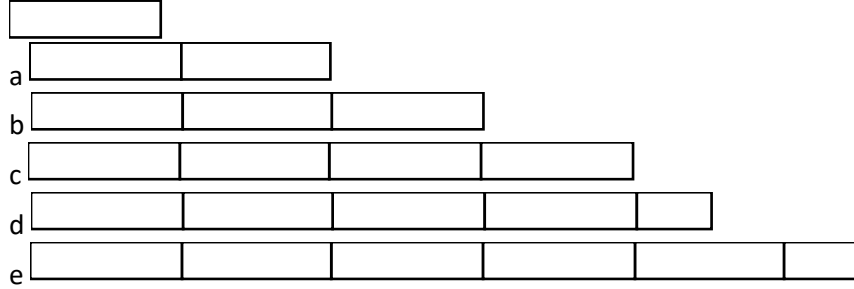
1. $14^2 - (34 + 36 \div 9 \times 20)$	2. $8^2 \times 15 \div (29 + 46 - 34)$
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4. Solve for x using the correct reverse operations:

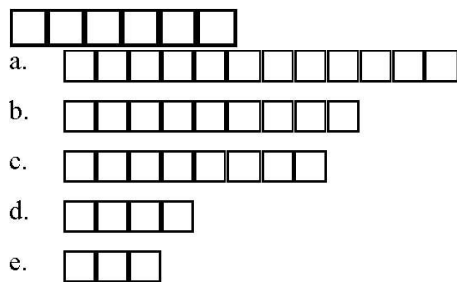
$$\frac{x^2}{3} - 1 = 9$$

Challenge problems

1. If the rectangle shown here represents $\frac{2}{3}$, which picture below best represents 3?



2. The figure shown here represents $\frac{3}{2}$. Which of the choices would represent $\frac{3}{4}$? (This means $\frac{3}{4}$ of 1, not $\frac{3}{4}$ of $\frac{3}{2}$.)



3. Which statement is true about $\left(\frac{7}{8}\right)^{600} \times \left(\frac{8}{7}\right)^{500}$?

- The product is greater than 2,100.
- The product is greater than 700 but less than 1000.
- The product is greater than 3 but less than 700.
- The product is greater than 1 but less than 3.
- The product is less than 1 but greater than 0.

4. There are three tribes on an island. Members of the Liar Tribe always lie. Members of the Truthful Tribe always tell the truth. Members of the Alternator Tribe always alternate their statements: they tell one lie, then one true statement, then one lie, and so on. Which situation is impossible?

- a. A Liar says, "I am a Liar."
- b. A Truthful says, "I am a Truthful."
- c. An Alternator says, "I am a Liar."
- d. A Liar says, "I am a Truthful."
- e. An Alternator says, "I am an Alternator."

5. When I enter 25^{25} in my calculator, displays 8.881784197E34. Which statement is true?

- a. The answer the calculator gave is only an approximation of the correct answer.
- b. If the screen were big enough, the result of 25^{25} would display 34 zeros after the 97.
- c. If the screen were big enough, the result of 25^{25} would display 33 zeros after the 97.
- d. If the screen were big enough, the result of 25^{25} would display 25 zeros after the 97.
- e. If the screen were big enough, the result of 25^{25} would display 24 zeros after the 97.

6. Conver the following number in the indicated bases to decimal value (base 10).

- a) 521_{six} b) 88_{nine} c) $3CD9_{\text{sixteen}}$

7. Which statement is true?

- a) $\frac{3}{4} < \left(\frac{3}{4}\right)^{30}$ b) $\left(\frac{2}{3}\right)^{60} < \left(\frac{4}{9}\right)^{30}$ c) $\left(\frac{2}{3}\right)^{30} < \left(\frac{3}{4}\right)^{20}$ d) $\left(\frac{20}{30}\right)^3 < \left(\frac{2}{3}\right)^{30}$ e) $1 < \left(\frac{3}{4}\right)^{30}$

8. Find the value of the expression $100 - 98 + 96 - 94 + 92 - 90 + \dots + 8 - 6 + 4 - 2$.

9. Which of the following numbers is not a perfect square? Explain.

- a) 1^{2016} b) 2^{2017} c) 3^{2018} d) 4^{2019} e) 5^{2020}

10. If n and m are integers and $n^2 + m^2$ is even, which of the following is impossible?

- a) n and m are even b) n and m are odd c) $n + m$ is even
d) $n + m$ is odd e) none of these are impossible

11. What is the binary (base 2) representation of the decimal value of 544?