

**Instructions:** Record your answers to each of these problems directly on this page. Do the work on a separate page and attach these pages to this one. You should do the work by hand, but you may check your work with a calculator.

1. Consider the following set:
- $$\left\{ 9, -0.25, \frac{\sqrt{2}}{\pi}, -1, |-23|, -\sqrt{\frac{81}{16}}, 301.001000100001\dots, \frac{39}{13}, \frac{47}{5}, \sqrt{\pi e}, (-4)^2 \right\}$$

Using correct set notation, give the elements that also belong to each of the following sets.  
 [Hint: You may want to simplify some expressions first.]

- a. The Natural Numbers  $\{9, |-23|, \frac{39}{13}, (-4)^2\}$
- b. The Rational Numbers  $\{9, -0.25, -1, |-23|, -\sqrt{\frac{81}{16}}, \frac{39}{13}, \frac{47}{5}, (-4)^2\}$
- c. The Irrational Numbers  $\{\frac{\sqrt{2}}{\pi}, 301.001000100001\dots, \sqrt{\pi e}\}$
- d. Integers  $\{9, -1, |-23|, \frac{39}{13}, (-4)^2\}$

2. For the numbers in the set  $\{\frac{55}{7}, -11, 4, \sqrt{64}, -6.75, 14000, \sqrt{19}, \pi^2, \frac{0}{3}, 0.\overline{69}, \frac{16}{8}\}$ , which numbers are:

- a. Real Numbers *the whole set*
- b. Irrational Numbers  $\{\sqrt{19}, \pi^2\}$
- c. Rational Numbers  $\{\frac{55}{7}, -11, 4, \sqrt{64}, -6.75, 14000, \frac{0}{3}, 0.\overline{69}, \frac{16}{8}\}$
- d. Integers  $\{-11, 4, \sqrt{64}, 14000, \frac{0}{3}, \frac{16}{8}\}$
- e. Natural Numbers  $\{4, \sqrt{64}, 14000, \frac{16}{8}\}$
- f. Are any numbers in the list not real? If not, give an example a number that is not real. *all the numbers are real.  $\frac{0}{3}, \sqrt{-1}$  are not real*

3. Round the following numbers to the indicated digit.

- a. 12,456 (thousands) *12,000*
- b. 45,723 (hundreds) *45,700*
- c. 24.8901 (ones) *25*
- d. 0.06 (tenths) *0.1*
- e. 0.888 (hundredths) *0.89*
- f. 0.68943 (thousandths) *0.689*
- g. 95.8 (tens) *100*

- 4. Write 265,089 in words and then in expanded notation.  
*two hundred sixty five thousand, eighty-nine*
- 5. Write six billion two hundred fifty-four million five hundred forty thousand one in standard notation.  
*6,254,540,001*

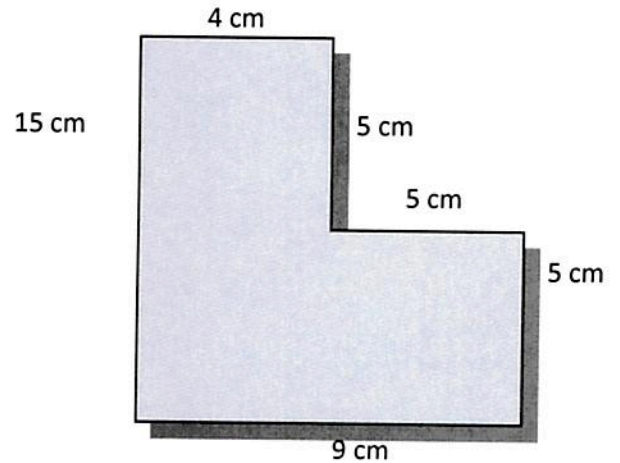
8. Round 8459
- a) to the nearest 10s *8460*
  - b) to the nearest 100s *8500*
  - c) to the nearest 1000s *8000*

6. Add  $23 + 19 + 7 + 21 + 4$  *74*

7. Add  $12,070 + 2,954 + 3,400 = 18,424$

8. Find the perimeter of:

$15 + 9 + 5 + 5 + 5 + 4 = 43 \text{ cm}$



9. Subtract  $6246 - 1879 = 4367$

10. Simplify  $12 - 6 - 4 = 2$

11. Insert < or > between the following pairs of numbers to make a true statement

- a)  $12 > 8$
- b)  $210 > 189$
- c)  $4 < 14$

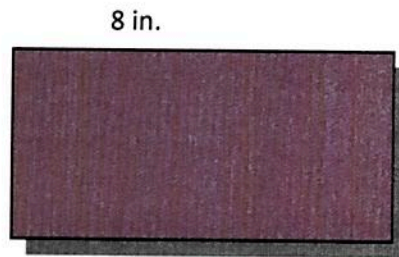
12. Estimate to the nearest 10s  $872 + 35 + 3 + 59 + 84$   
 $870 + 40 + 0 + 60 + 80 = 1050$

13. Multiply  $(37)(2) = 74$

14. Multiply  $(2344)(306) = 717,264$

15. Find the area of:  $8 \times 3 = 24 \text{ in}$

3 in.



16. Divide  $3642 \div 5 = 728 \text{ R}2$

17. Divide  $532 \div 19 = 28$

18. State the order of operations **PEMDAS** → parentheses, exponents, multiplication & division, addition & subtraction

19. Evaluate  $5^4 = 625$

20. Simplify  $4^2 \div (10 - 9 + 1)^3 \times 3 - 5 = 16 \div 8 \times 3 - 5 = 2 \times 3 - 5 = 6 - 5 = 1$

21. Simplify  $2^3 \times 2^8 \div 2^9 = \frac{2^3 \cdot 2^8}{2^9} = \frac{2^{11}}{2^9} = 2^2 = 4$

22. Simplify  $4^3 + 9 \times 12 - (4 + 3 \times 17) = 64 + 108 - 55 = 117$

23. Simplify  $[9 \times (6 - 4) \div 8] + [7 \times (8 - 3)] = 9 \times 2 \div 8 + 7 \times 5 = 18/8 + 35 = \frac{9}{4} + 35 = 149\frac{1}{4} = 37\frac{1}{4}$

24. Simplify  $(80 \div 16) \times [(20 - 56 \div 8) + (8 \times 8 - 5 \times 5)]$   
 $5 [(20 - 7) + (64 - 25)] = 5 \times (13 + 39) = 5 \times 52 = 260$