

You have the full class period to complete this exam. Please **show all of your work** on the test paper next to the related problem. Be sure to **include units of measure** in answers to application problems. **Circle your answers** whenever possible. Do not round answers unless instructed to do so. No calculators or notes are allowed. Please use a pencil, **not a pen**. Now just relax and show me what you have learned. Good luck!

For numbers 1-6, solve each equation. If your answer is not a whole number, you may answer with either a fraction or a decimal. But **DO NOT** round your answers! [16 pts]

1. $32 = 12y$
 $y = \frac{8}{3}$

2. $\frac{1}{2}x = 10$
 $x = 20$

3. $7a - 3 = 18$
 $a = 3$

4. $-3(x+5) + 2 = 4(x+6) - 9$
 $x = -4$

5. $\frac{2}{3}x + \frac{1}{6} = \frac{1}{2}x + \frac{1}{3}$
 $x = 1$

6. $-5(0.2x + 0.1) = 0.8 + 1.9$
 $x = -3.2$

For numbers 7-9, evaluate each exponential expression. If a number is raised to a power please **multiply it out completely in your final answer**. For example, instead of leaving 5^2 in your answer, simplify it to 25. [5 pts]

7. $6^{-2} = \frac{1}{36}$

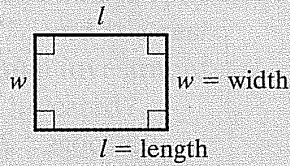
8. $\frac{1}{2^{-3}} = 8$

9. $13^0 = 1$

For numbers 10, 11, and 12 (number 12 is on the next page), follow the problem-solving steps we discussed in class to solve each problem. Write down your unknowns in words and choose a variable, write an equation, solve the equation, and answer in a complete sentence. You will lose points if you don't show each of these steps. [12 pts]

You may wish to use these formulas:

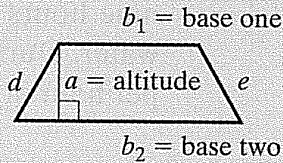
A **rectangle** is a parallelogram with all interior angles measuring 90° .



$$\text{Perimeter} = 2l + 2w$$

$$\text{Area} = lw$$

A **trapezoid** is a four-sided figure with two sides parallel. The parallel sides are called the bases of the trapezoid.



Perimeter = the sum of all four sides

$$\text{Area} = \frac{1}{2}a(b_1 + b_2)$$

10. A rectangular parking lot measures 40 feet in length. If the perimeter of the parking lot is 400 feet, what is the width of the parking lot?

The width of the parking lot is 160 ft.

11. A trapezoid has an area of 15 square meters. If the bases measure 4 meters and 6 meters, find the altitude of the trapezoid.

The altitude of the trapezoid is 3 meters.

12. Bill is buying gifts for his mom and his sister. The amount he plans to spend on his sister is six dollars less than twice as much as he plans to spend on his mom. He will spend a total of \$69. How much will he spend on his mom's gift, and how much will he spend on his sister's gift?

Bill will spend \$25 on his mom's gift and \$44 on his sister's gift.

For numbers 13-18, simplify each exponential expression. Combine like bases as much as possible and write your answer with only positive exponents. [12 pts]

13. $(p^3)^7 = p^{21}$

16. $\frac{y^{-4}}{z^{-8}} = \frac{z^8}{y^4}$

14. $(2y^3)(7y^4) = 14y^7$

17. $(3m^2)^{20} = 3^{20}m^{40}$

15. $x^{-9}x^7 = \frac{1}{x^2}$

18. $\frac{7a^2}{21a^5} = \frac{1}{3a^3}$