



Jakarta International School

8th Grade – AG1

Practice Test - Blue

Exponents, Radicals, and the
Pythagorean Theorem

Name: _____

Date: _____

Score: $\frac{\quad}{58}$

58

Goal 7: Apply Exponents, Radicals, and the Pythagorean Theorem

**** 2 Points Per Problem Unless Stated Otherwise ****

1. Solve for x

A. $4^{-x} \cdot 4^3 = 4^{2x} \cdot 4^3$

B. $2^x \cdot 5^x = 10^{20}$

C. $5^4 = \left(\frac{1}{25}\right)^x$

2. If $x \oplus y = (x^y)^x$, what is the units digit of $7 \oplus 5$?

3. Given that $2^2 + 2^2 = 2^x$ and $4^3 + 4^3 + 4^3 + 4^3 = 4^y$, what is the value of y^x ?

4. One billion is 10^n divided by one-millionth. What is the value of n?

5. There are about $5 \cdot 10^{19}$ cubic feet of water on the earth. A thimble the size of your thumb holds $5 \cdot 10^{-4}$ cubic feet of water. How many thimblefuls of water are on the earth?

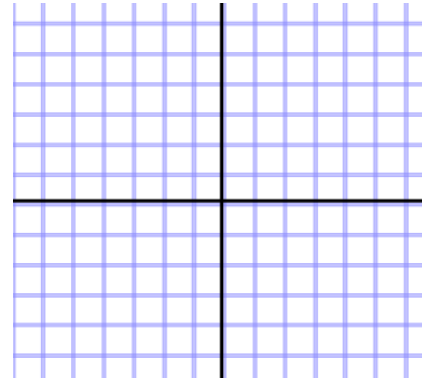
6. Simplify or evaluate the following expressions. Write answers in simplest form.

A. $(7^3 + 7^3 + 7^3 + 7^3 + 7^3 + 7^3 + 7^3)^{\frac{1}{2}}$

B. $(.15)^{-3}(.5)^5$

C. $(-1w^2t^3)^6(-1w^7t^{11})^2$

7. Graph the following function: $y = -2^x$



8. Between 1990 and 2000, the profits of a business decreased by approximately 10% each year. In 1990, the business' profit was \$1 million.

A. Write an exponential model showing the business' profit P , t years after 1990.

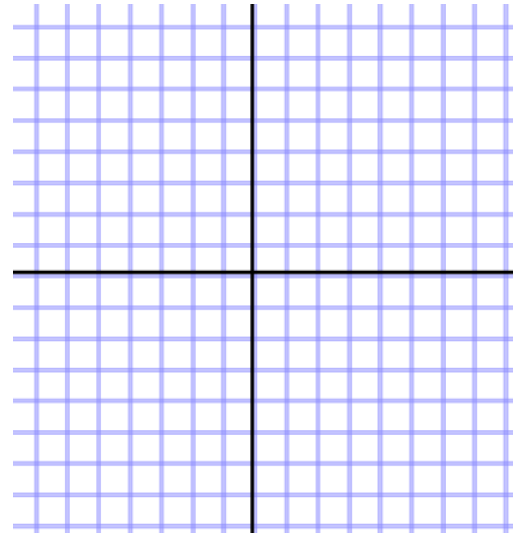
B. Use your model to determine the profit in 1993.

9. Write an example of a quadratic equation in the form $x^2 = d$ for the following situations:

a. An equation that has no real solution **(1 point)**

10. Sketch the graph. Then, identify its domain and range.

$y = 2\sqrt{x} + 1$ **(3 points)**



11. Evaluate or simplify the following expressions without using a calculator

A. $125^{\frac{1}{3}}$	B. $216^{\frac{4}{3}}$	C. $6^{\frac{1}{2}} \cdot 6^{\frac{3}{2}}$	D. $\sqrt[3]{y(x^6 \cdot y^2)^{\frac{1}{3}}}$
E. $\sqrt[3]{\frac{(5!)(5!)(6!)}{3/4}}$		F. $\frac{\sqrt{1936a^3b^9}}{\sqrt{2}}$	

12. Solve the equations. Write the solutions(s) as simplified as possible.

A. $8(x + \frac{1}{2})^2 = 32$	B. $\sqrt{x} + 13 = 0$
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13. What is the largest integer k such that $k^3 < 10^6$?

14. The hypotenuse of a right angled triangle is twice the length of one leg of the triangle. The length of the other leg is 12 cm. How many square centimeters are in the area of the right triangle? Express your answer in simplest radical form. **(4 points)**

15. **Cheap Sunglasses:** Gilbert was working on lighting for the school play and thought that he could make a cool pair of sunglasses by attaching some of the red filter film to his glasses. He did some research and learned that 20 percent of the light passing through the filter is absorbed. He also read that good sunglasses should absorb 80 percent of the incoming light, so he figured that if he put four layers of filter film on his glasses he'd be all set.

Calculate the percentage of light that passes through one layer of filter film, two layers of film, three layers of film, and four layers of film. Is Gilbert right?

Write a formula that will calculate the percentage of light that will pass through n layers of filter film.