

Warm Up Algebra 3 10/3/17

Reminders: Quiz Friday, Office hours Thursday before school, I will be out Friday and next Monday. Please be looking to complete your ALEKS goals!!!

- 1.) Take out your chromebook
- 2.) go to my website
www.mrallenwando.weebly.com
and on the home page click on 'Algebra 3
Warm Up 10/3/17'
- 3.) Follow directions

My Advice

Take it or Leave it

What is your return on investment (ROI) for attending the colleges or universities on your list???

My numbers:

Total cost of attendance: \$100,000
(graduate and undergraduate)

Calculated monthly payment: \$1150 (\$13,800 per year)

My current monthly Salary after taxes: \$2,314 (\$27,768 per year)
(this is readily available public knowledge)

After student loan payments: \$1,164 (\$11,486)

Job paying 10\$/hour

Monthly Salary \$1,213

Exponential Models of Growth and Decay

Radioactive decay -

half life model

$$A = A_0 \left(\frac{1}{2} \right)^{\frac{t}{h}}$$

Model with e

$$N = N_0 e^{-\lambda t}$$

Table of Half-lives

Element	Half-life
Bismuth-212	60.5 minutes
Carbon-14	5730 years
Chlorine-36	400,000 years
Cobalt-60	5.26 years
Iodine-131	8.07 days

Element	Half-life
Phosphorous-24	14.3 days
Polonium-215	0.0018 seconds
Radium-226	1600 years
Sodium-24	15 hours
Uranium-238	4.5 billion years

2. If 1 g of sodium-24 has decayed from a sample that was originally 2 g, how old is the sample?

3. What fraction of chlorine-36 remains undecayed after 200,000 years?

Exponential Models of Growth and Decay

Population Growth -

$$P = P_0 e^{rt}$$

Ex.)

The population of a city grows at a rate of 5% per year. The population in 1990 was 400,000. What would be the predicted current population? In what year would we predict the population to reach 1,000,000?

Inverses of Relations

An **inverse relation** is a relation in which each output from the original relation now maps to its original input. This is equivalent to switching the x - and y -values in each ordered pair of the relation.

x	$f(x)$

x	$f^{-1}(x)$

Inverse Functions

When the relation is also a function, you can write the inverse of the function $f(x)$ as $f^{-1}(x)$. This notation does *not* indicate a reciprocal.

Functions that 'undo' each other are **inverse functions**.

$$f(f^{-1}(x)) = f^{-1}(f(x)) = x$$

$$f(x) = 3x + 2 \quad \text{and} \quad g(x) = \frac{x-2}{3}$$

Are inverse functions

x	f(x)

x	g(x)

Finding Inverse Functions

1.) In the original function $f(x)$, 'swap' the x and the y or $f(x)$ variables

2.) Solve this equation for y or $f(x)$

9) $h(x) = \sqrt[3]{x} - 3$

10) $g(x) = \frac{1}{x} - 2$

Practice

11) $h(x) = 2x^3 + 3$

12) $g(x) = -4x + 1$

13) $g(x) = \frac{7x + 18}{2}$

14) $f(x) = x + 3$

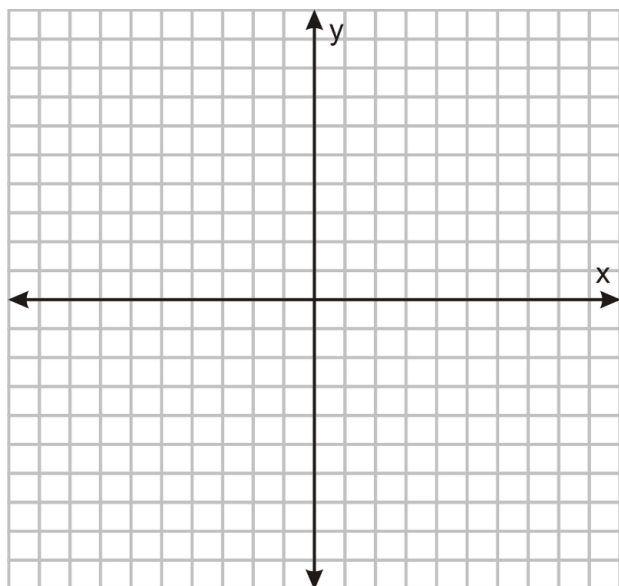
15) $f(x) = -x + 3$

16) $f(x) = 4x$

What does the graph of an Inverse function look like??

$$f(n) = \frac{-16 + n}{4}$$

$$g(n) = 4n + 16$$



To graph the **inverse relation** or **inverse function**, you can reflect each point across the line $y = x$.