- Pick Up the Warm Up

HW Help

① Convert $\log_6(60) = t$ to exponential form

base is 6

The log statement produces an expont, t

So....

$$6^t = 60$$

or

$$60 = 6^t$$

② Solve $3.26^{x+1} = 99$ for x

[show exact answer in terms of log base 10 and approx. to 2 dp.]

$$\log(3.26^{x+1}) = \log(99)$$

$$(x+1)\cdot\log(3.26) = \log(99)$$

$$x+1 = \frac{\log(99)}{\log(3.26)}$$

$$\boxed{x = \frac{\log(99)}{\log(3.26)} - 1}$$

$$x \approx 2.89$$

(3) Watch the pattern develop as your teacher [Mr. C] converts each to base 10.

→ $\log_8(3) = \dfrac{\log(3)}{\log(8)}$ or $\dfrac{\log_7(3)}{\log_7(8)}$

→ $\log_5(x) = \dfrac{\log(x)}{\log(5)}$

→ $\log_n(700) = \dfrac{\log(700)}{\log(n)}$

→ $\log_{base}(input) = \dfrac{\log(input)}{\log(base)}$

This leads to the change of base formula which is:

$\log_a(b) =$ $=$

This is called the

change of base formula

$$\log_a(b) = \frac{\log(b)}{\log(a)}$$

which, in fact, can be converted to <u>any</u> base

This is called the

change of base formula

$$\log_a b = \frac{\log b}{\log a} = \frac{\log_n b}{\log_n a}$$

which, in fact, can be converted to any base

(4) Find this formula on your reference sheet.

(5) Now add to your own notes.

Log Properties: If $y = b^x$, then $x = \log_b y$ **also......** $\log_b x^n = n\log_b x$

$$\log_b(m) + \log_b(n) = \log_b(mn) \qquad \log_b(m) - \log_b(n) = \log_b\left(\frac{m}{n}\right)$$

$$\log_b(m) = \frac{\log m}{\log b}$$

can change to any base

$$\log_b(m) = \frac{\log(m)}{\log(b)}$$

Add to your notes

This is called the

change of base formula

$$\log_a b = \frac{\log b}{\log a} = \frac{\log_n b}{\log_n a}$$

which, in fact, can be converted to <u>any</u> base

Lastly, change the following log expression to one with base 5

$\log_3 4 = \dfrac{\log_5 4}{\log_5 3}$

$1.04^x = 2$

not helpful

convert to log form

$x = \log_{1.04}(2)$

Now use change of base formula

$x = \dfrac{\log(2)}{\log(1.04)}$

helpful

Take log of both sides

$\log(1.04^x) = \log 2$

$x \cdot \log(1.04) = \log(2)$

$X = \dfrac{\log(2)}{\log(1.04)}$ } exact answer in terms of common log

$X \approx 17.673$

HW Questions

Answer 103 a

$x = -3$

$y = 5$

$z = 10$

$\boxed{6-72}$ Find a quadratic in the form $y = ax^2 + bx + c$ that ~~passes~~ through the three points.

$(1, 5)$ $5 = a(1)^2 + b(1) + c$ → $\boxed{I}$ $5 = a + b + c$

$(3, 19)$ $19 = a(3)^2 + b(3) + c$ → $\boxed{II}$ $19 = 9a + 3b + c$

$(-2, 29)$ $29 = a(-2)^2 + b(-2) + c$ → $\boxed{III}$ $29 = 4a - 2b + c$

$\boxed{II}$ $19 = 9a + 3b + c$

$\boxed{I}$ $5 = a + b + c$

Subtract $14 = 8a + 2b$

$\boxed{III}$ $29 = 4a - 2b + c$

$\boxed{I}$ $5 = a + b + c$

Subtract $24 = 3a - 3b$

Ⓐ $14 = 8a + 2b \xrightarrow{3} 42 = 24a + \cancel{6b}$

Ⓑ $24 = 3a - 3b \xrightarrow{2} 48 = 6a - \cancel{6b}$

$90 = 3a$

so... $a = 3$

$42 = 24(3) + 6b$

$42 = 72 + 6b$

$-30 = 6b$

so $b = -5$

$5 = a + b + c$

$5 = 3 + (-5) + c$

$5 = -2 + c$

$c = 7$

$$\boxed{y = 3x^2 - 5x + 7}$$

$\boxed{97}$

$\log(x) = 0$ $10^0 = x$ 1

$\log(x) = 1$ $10^1 = x$ 10

$\log(x) = 2$ $10^2 = x$ 100

Aim

$$10^n = 1500$$

Use properties of logs to simplify log expressions

Why?

because log equations can get more complex

$$5 \cdot \log_3(x) - \log_3(2x) = 14$$

Tape or Write into your notes?

Logarithm Properties

The following definitions and properties hold true for all positive $m \neq 1$.

ch.5

Definition of logs:	$\log_m(a) = n$ means $m^n = a$
Product Property:	$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$
Quotient Property:	$\log_m(\frac{a}{b}) = \log_m(a) - \log_m(b)$
Power Property:	$\log_m(a^n) = n \cdot \log_m(a)$

Take notes as we do

109 together

a) $\log_{11}(4) + \log_{11}(2) - \log_{11}(5)$

Goal: Condense to a single term

$\log_{11}(4 \cdot 2) - \log_{11}(5)$

$\log_{11}\left(\frac{4 \cdot 2}{5}\right) = \log_{11}\left(\frac{8}{5}\right)$

$7 - 2 \cdot 1 - 8$

$7 - 1 - 8$

$5 + 1 - 8$

$6 - 8$

-2

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

$$\log_m\left(\frac{a}{b}\right) = \log_m(a) - \log_m(b)$$

b. $\log_2(M) + \log_3(N)$

can't

(base is not the same)

$\frac{\log(M)}{\log(2)} + \frac{\log(N)}{\log(3)}$

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

c. $\log(k) + x\log(m)$

$\log(k) + \log(m^x)$

$\log(k \cdot m^x)$

d. $\frac{1}{2}\log_5 x + 2\log_5(x+1)$

$\log_5\left[x^{\frac{1}{2}} \cdot (x+1)^2\right]$

$\log_5 x^{\frac{1}{2}} \cdot (x+1)^2$

$\sqrt{x}$

$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$

e. $\log(4) - \log(3) + \log(\pi) + 3\log(r)$

$$\underbrace{\log(4) - \log(3)} + \log(\pi) + \log(r^3)$$

$$\underbrace{\log\left(\frac{4}{3}\right) + \log(\pi)} + \log(r^3)$$

$$\log\left(\frac{4}{3}\pi\right) + \log(r^3)$$

$$\log\left(\frac{4}{3}\pi r^3\right)$$

$$\log_m(a \cdot b) = \log_m(a) + \log_m(b)$$

$$\log_m\left(\frac{a}{b}\right) = \log_m(a) - \log_m(b)$$

f. $\log(6) + 23 \log(10)$

Now backwards.

expand $\log 3m^3p^2$

$\log(3) + 3\log(m) + 2\log(p)$

$3x$

$x + x + x$

B.B.

Next week - State Testing
- All Grade 11

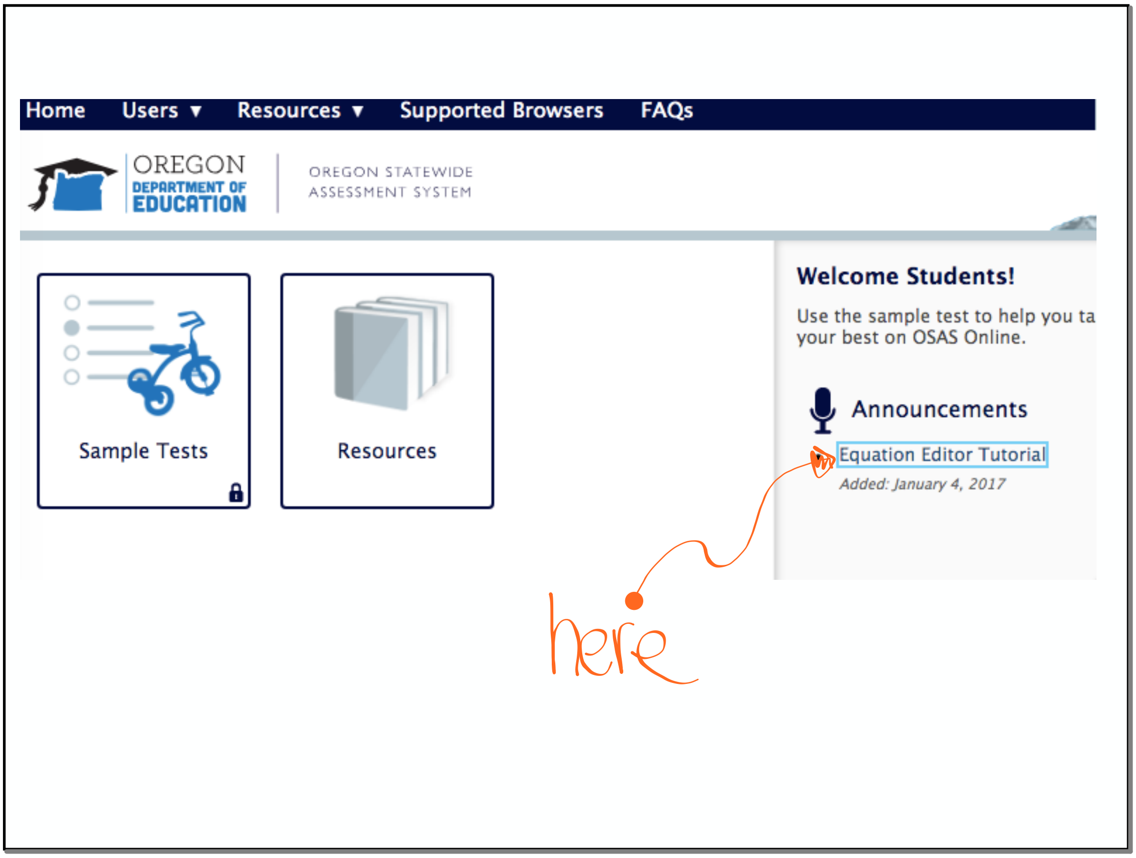
Mon
Tues
Wed

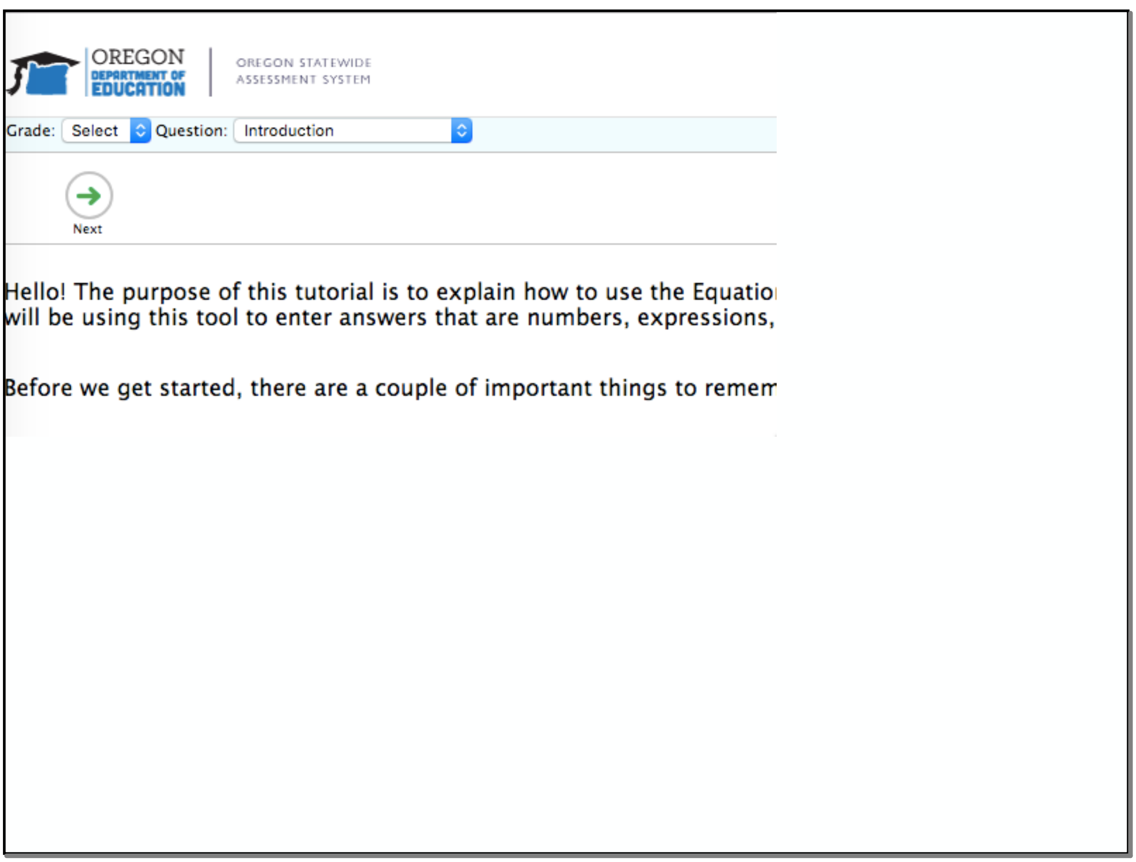
- 3 ways to meet Essential Skills requirement and this is the only free option.
- No new lessons during class Mon, Tue, Wed
- There will be review assignments [to prepare for next test]
- In comp. labs A1, A2

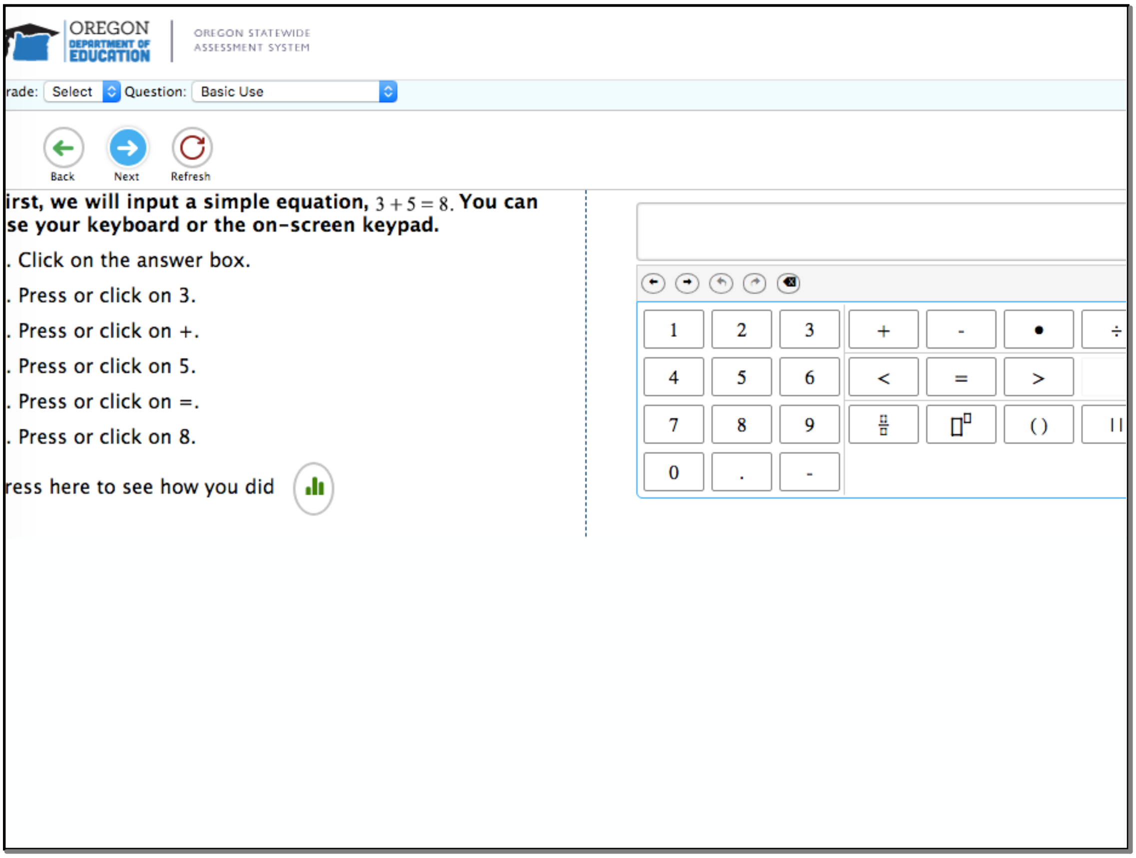
all Grade 11 students

Laptops → familiar with Calculators

https://oaksportal.org/users/students.stml


Home
Users ▼
Resources ▼
Supported Browsers
FAQs
OREGON
DEPARTMENT OF
EDUCATION
OREGON STATEWIDE
ASSESSMENT SYSTEM
Sample Tests
Resources
Welcome Students!
Use the sample test to help you ta
your best on OSAS Online.
Announcements
Equation Editor Tutorial
Added: January 4, 2017
here


OREGON
DEPARTMENT OF
EDUCATION
OREGON STATEWIDE
ASSESSMENT SYSTEM
Grade: Select
Question: Introduction
Next
Hello! The purpose of this tutorial is to explain how to use the Equatio
will be using this tool to enter answers that are numbers, expressions,
Before we get started, there are a couple of important things to remem



Assignment

6.....41b, 113, 114a, 115, 122ab

7.....163