

SEM. 2 REVIEW - DAY 2

Can use:

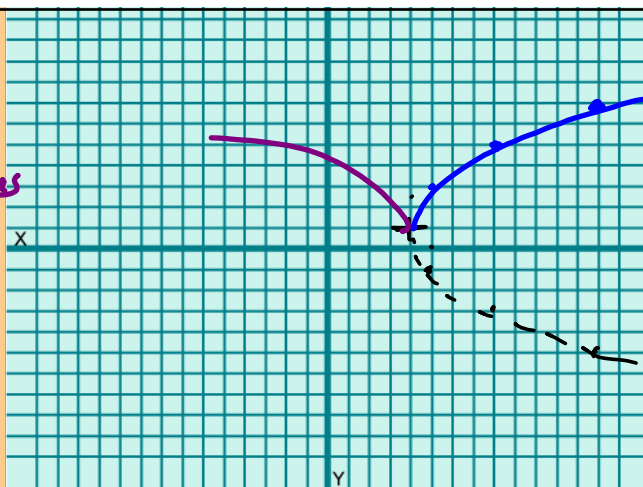
- x pink sheet
- * Normal curve table

Will give:
Exp/Log
formulas
Seg formulas

$$y = 2\sqrt{x-4} + 1$$

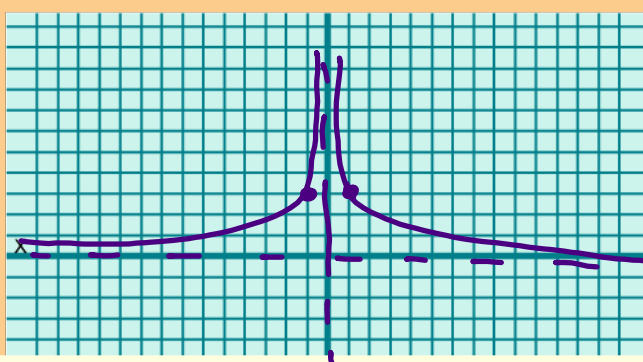
Right 4 UP 1

0	0
4	+0
9	4 2 6



$$y = -2\sqrt{x-4} + 1$$

0	0
4	+0
9	4 2 6



$$y = 2\sqrt{9-x} + 1$$

$2\sqrt{-(x-4)} + 1$

0	0
4	+0
9	4 2 6

$$y = \frac{3}{x^2}$$

$$y = 3 \cdot \frac{1}{x^2}$$

1	x^3
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Rational Functions

Mult/Div \leftarrow **Simplify** \rightarrow Add/Subtract
 no = sign
 * Factor all quantities
 * Cross cancel
 * Div - Keep-Change-Flip!

$$\begin{aligned}
 & \frac{x \cdot \frac{2x+3}{x^2-16}}{x \cdot (x+4)(x-4)} + \frac{x+1}{x^2-4x} \cdot \frac{(x+4)}{x(x-4)(x+4)} \\
 & \frac{2x^2+3x}{x(x+4)(x-4)} + \frac{x^2+4x+x+4}{x(x+4)(x-4)} = \boxed{\frac{3x^2+8x+4}{x(x+4)(x-4)}}
 \end{aligned}$$

23 a) $\frac{1}{3x+1} - \frac{5}{3x} = \frac{x+7}{3x+1}$ **Solve.** $3x+1=0$
 $3x=-1$
 $x=-1/3$

1) Excluded values
 $x \neq 0, -1/3$

2) Multiply by the common denominator

$$\begin{aligned}
 x(3x+1) - 5(3x+1) &= 3x(x+7) \\
 3x^2 + x - 15x - 5 &= 3x^2 + 21x \\
 -14x - 5 &= 21x \\
 -5 &= 26x \\
 \frac{-5}{26} &= \frac{26x}{26}
 \end{aligned}$$

D / R = T

up	20	15-x	$\frac{20}{15-x}$
down	20	15+x	$\frac{20}{15+x}$

Boat = 15 mph $x =$ Speed of Current
 Current = ?
 Go 20 miles upstream & return in 5 hrs.

$$\frac{20}{15-x} + \frac{20}{15+x} = 5$$

Upstream trip was $3/4$ hr. longer than downstream.

$$\begin{aligned}
 \text{More Time} - \text{Less Time} &= \frac{3}{4} \\
 \frac{20}{15-x} - \frac{20}{15+x} &= \frac{3}{4}
 \end{aligned}$$

Exponential Functions

2) $y = 2^x$

0		2 ⁰ = 1
1		2 ¹ = 2
2		2 ² = 4
3		2 ³ = 8

$y = 2^{x-4} - 3$
Right DOWN 3

$y = -2^{x-4} - 3$

0		1
1		2
2		4
3		8

$y = 2^{-(x-4)} - 3$
Exp. Decay

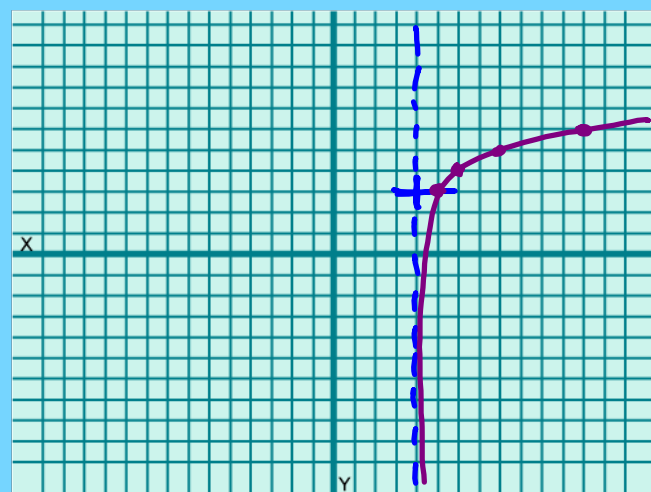
0		1
1		1/2
2		1/4
3		1/8

Logs

$y = \log_2(x-4) + 3$

1		0
2		1
4		2
8		3

Right UP 3



LOGARITHMS

Like 30a

$$\frac{1}{2^4} \left(\frac{1}{16}\right)^{x-2} = \sqrt[3]{2^x}$$

$$(2^{-4})^{x-2} = 2^{x/3}$$

$$2^{-4x+8} = 2^{x/3}$$

$$3[-4x+8 = \frac{x}{3}]$$

$$-12x+24 = x$$

$$24 = 13x$$

$$\frac{24}{13} = x$$

Make common bases!

$$\ln x = \log_e x$$

$$\log x = \log_{10} x$$

Evaluate.

$$\log_5 125 = \log_5 5^3 = 3$$

$$\log_7 \frac{1}{49} = \log_7 7^{-2} = -2$$

$$\ln \sqrt[3]{e^2} = \ln e^{2/3} = \frac{2}{3}$$

Properties of Logs

$$\log_b x + \log_b y = \log_b xy$$

$$\log_b x - \log_b y = \log_b \frac{x}{y}$$

$$\log_b x^p = p \cdot \log_b x$$

$$2 \log x^2 - \log(x^2-10) = 1$$

$$\log_{10} \left(\frac{x^2}{x^2-10}\right) = 1$$

$$10^{\log_{10} \left(\frac{x^2}{x^2-10}\right)} = 10^1$$

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

$$x^2 = 10x^2 - 100$$

$$0 = 9x^2 - 100$$

$$6 = (3x-10)(3x+10)$$

$$x = \frac{10}{3}, \frac{10}{3}$$

Check! Cannot have log of a neg. #

log₁₀

EXPONENTIATE!

Pop. of Seneca = 2000

Growing 2.3%

How many years to have pop. of 5000?

$$N = N_0(1 \pm r)^t$$

$$5000 = 2000(1+0.023)^t$$

$$\frac{5000}{2000} = \frac{2000 \cdot (1.023)^t}{2000}$$

$$2.5 = 1.023^t$$

$$\frac{\log(2.5)}{\log(1.023)} = \frac{t \cdot \log(1.023)}{\log(1.023)}$$

$$40.295 = t$$

$$40.3 \text{ yrs} = t$$

STATS

{ 3, 7, 9, 17 }

Find st. dev.

- 1) Find mean = $\frac{36}{4} = 9$
- 2) Data-Mean = $(-6)^2 + (-2)^2 + (0)^2 + (8)^2$ /over:
- 3) Square Differences = $\sqrt{\frac{104}{4}}$ Upper:
- 4) Find mean of Square
- 5) Square root = $\sqrt{26} = 5.1$

Find Med + Q₁, Q₃

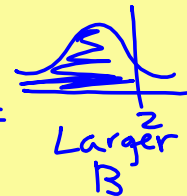
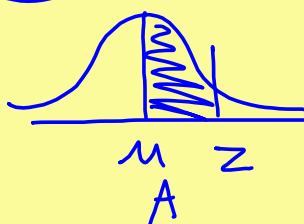
Med = 72
Q₁ = 65
Q₃ = 77

IQR =
=

Outliers:

Normal Distributions

$$Z = \frac{\text{Raw Score} - \text{Mean}}{\text{St. Dev}} = \frac{x - \mu}{\sigma}$$

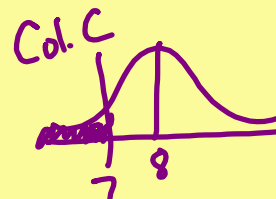


500 H.S. 100 m dash competitors

$\mu = 8.0$ sec $\sigma = 0.4$

How many runners below 7 sec?

$$Z = \frac{7 - 8}{0.4} = -2.5$$



$$0.0062 \times 500 = 3$$

Patterns
Permutations

All objects $n!$
Part of objects nPr

Alike: $\frac{\text{total!}}{\text{alike! alike!}}$

Special positions
or repeat:
draw blanks

Combinations:
 nCr
groups

Conditional Probability

$$P(A|B) = \frac{P(AB)}{P(B)}$$

\uparrow \uparrow
 ?? Know

PROBABILITY = $\frac{\text{Suc}}{\text{total}}$ Odds = $\frac{\text{Suc}}{\text{fail}}$

Combinations

- 1) No Order
- 2) No Repl
- 3) Dependent

Order: Individ. prob $\frac{2}{3} \cdot \frac{2}{5} \cdot \frac{1}{2}$

Replacement: Individ prob.

Binomial Prob - 2 possible outcomes
Indep. events
(Same chance every time)

AND = Multiply

OR = Add (check for duplicates to subtract)

At least/At most = write out all possibilities