

SEMESTER REVIEW DAY 2

19 (c) $f(x) = \frac{x^2 + 4}{7}$

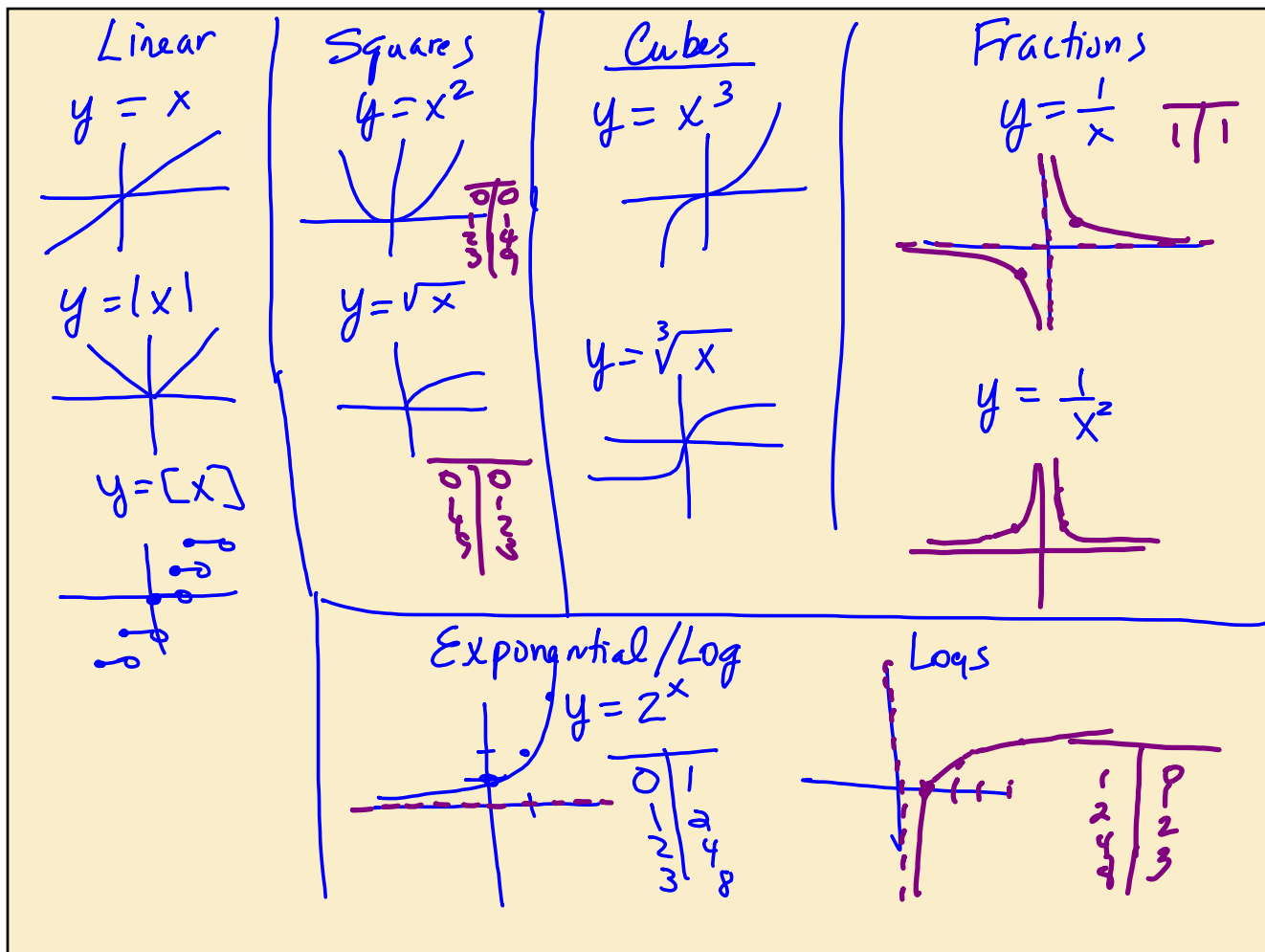
Find $f^{-1}(x)$. $7x = \frac{y^2 + 4}{7}$

1) Switch x + y

2) Solve for y .

$$\sqrt{7x - 4} = \sqrt{y^2}$$

$$\pm \sqrt{7x - 4} = y = f^{-1}(x)$$

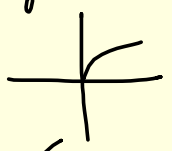


$$y = -2(x-4)^3 + 1$$

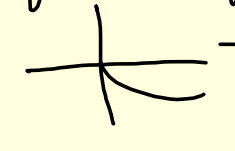
Right up
4 1

0	0
1	$x-2$
2	$8-16$

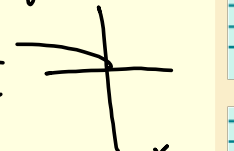
$$y = \sqrt{x}$$



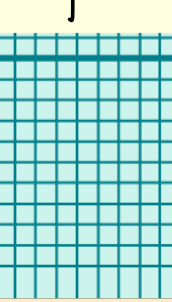
$$y = -\sqrt{x}$$



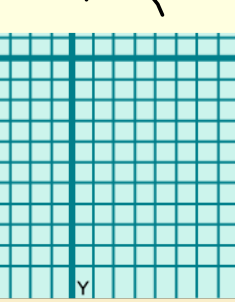
$$y = \sqrt{-x}$$



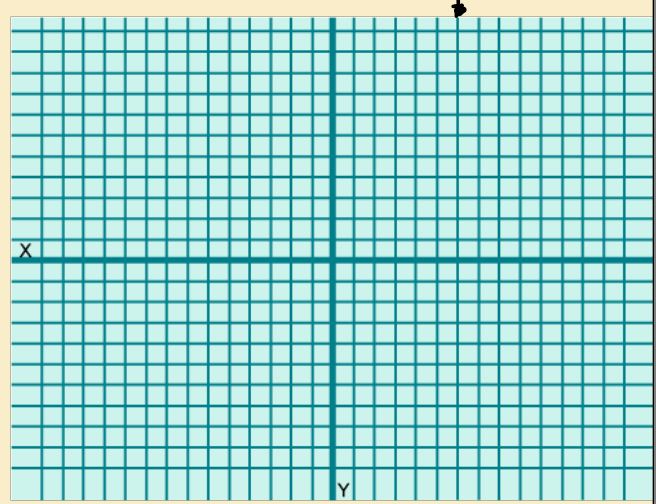
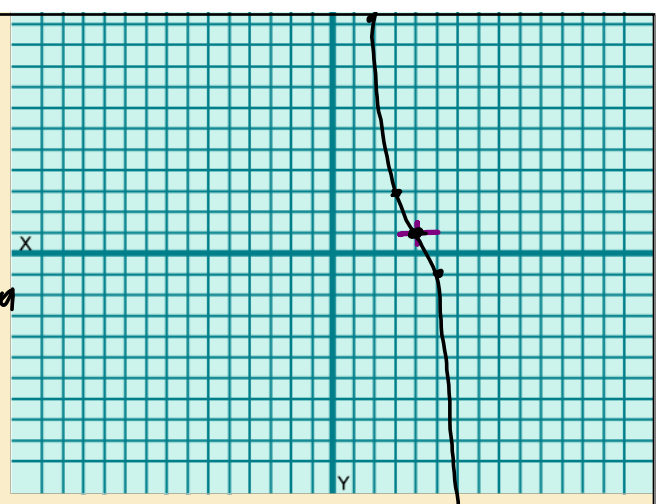
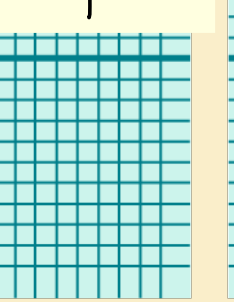
$$y = 2^x$$



$$y = -2^x$$



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



RATIONAL FUNCTIONS (Fractions) 22-24

Simplify 22(a) Mult./Div.
Factor + Cancel

$$\frac{x^2 - 4}{x^2 - 7x + 10} \cdot \frac{2x - x^2}{x^3 - 125}$$

Keep - Change - Flip

$$\frac{x^2 - 4}{x^2 - 7x + 10} \cdot \frac{x^3 - 125}{2x - x^2}$$

$$\frac{(x+2)(\cancel{x-2})}{(\cancel{x-5})(\cancel{x-2})} \cdot \frac{(\cancel{x-5})(x^2 + 5x + 25)}{-x(x-2)}$$

$$\frac{(x+2)(x^2 + 5x + 5)}{-x(x-2)}$$

b) Add/Subtract
Make common denominators

$$\frac{4}{6x - x^2} + \frac{2x}{x^2 - 36}$$

$$-\frac{4(x+6)}{x(x-6)(x+6)} + \frac{2x \cdot x}{(x+6)(x-6) \cdot x}$$

$$\frac{-4x - 24 + 2x^2}{x(x-6)(x+6)}$$

$$\frac{2(x^2 - 2x - 12)}{x(x+6)(x+6)}$$

$$\frac{2x^2 - 4x - 24}{x(x+6)(x+6)}$$

23/

SOLVE.

Has an = sign.

a)
$$\frac{3x \cdot \left[\frac{1}{3} - \frac{5}{3x} = \frac{x+4}{3x+1} \right]}{(3x+1)}$$

can't ÷ by 0
 $x \neq 0, -1/3$

Strategy:

Multiply by common denom
 + cancel all denoms.

$$x(3x+1) - 5(3x+1) = 3x(x+4)$$

$$3x^2 + x - 15x - 5 = 3x^2 + 12x$$

$$-14x - 5 = 12x$$

$$\frac{-5}{26} = \frac{26x}{26}$$

Like 24

Boat = 10 mph
 Current = ?

$x = \text{speed of current}$

Upstream 14 miles + back
 in 3 hrs.

How fast is current?
 $D \div R = T$

up
down

14	$10-x$	$\frac{14}{10-x}$
14	$10+x$	$\frac{14}{10+x}$

$$\frac{14}{10-x} + \frac{14}{10+x} = 3$$

LOGS!!! (and exponential func) (30-34)

30(a)
Solve.

$$\left(\frac{1}{27}\right)^{x+3} = \sqrt[5]{3^x}$$

$$\left(\frac{1}{3^3}\right)^{x+3} = 3^{\frac{x}{5}}$$

$$(3^{-3})^{x+3} =$$

$$3^{-3x-9} = 3^{x/5}$$

$$5 \left[-3x - 9 = \frac{x}{5} \right]$$

$$-15x - 45 = x$$

$$\left(\frac{-45}{16} = \frac{16x}{16} \right)$$

Make common bases!

$$\log_7 49 = \log_7 7^2 = 2$$

$$\log_{10} \frac{1}{100} = \log_{10} 10^{-2} = -2$$

$$\ln e^{85} = 85$$

$$\log_b m + \log_b n = \log_b (m \cdot n)$$

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

$$\log_b m^p = p \cdot \log_b m$$

$$\log_8 (4x+1) - \log_8 (2x) = 1$$

$$\log_8 \left(\frac{4x+1}{2x}\right) = 1$$

$$\log_8 \left(\frac{4x+1}{2x}\right) = 8^1$$

$$8 = 8$$

$$\cancel{2x} \cdot \frac{4x+1}{\cancel{2x}} = 8 \cdot 2x$$

$$4x+1 = 16x$$

$$\left(\frac{1}{12}\right) = \frac{16x}{12}$$

Check - Sub in
to make sure
all are by
of a + number

Exponentiate
to get rid
of logs!

34.

constant
↓
kt

$$q = q_0 e^{kt}$$

↑ final ↑ initial

$$\frac{10}{20} = \frac{20}{20} e^{-0.045t}$$

$$\ln \frac{1}{2} = \ln e^{-0.045t}$$

$$\frac{\ln(1/2)}{-0.045} = \frac{-0.045t}{-0.045}$$

15.4 yrs = t

College Tuition is normally distrib. with a mean of \$15,000 with a st. dev. of \$4000?
 What % of schools cost over \$20000?



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

$$= \frac{20,000 - 15,000}{4000} = 1.25$$

z
1.25

Col. C

0.1056

10.56%

