

SEMESTER REVIEW DAY 2 of 3

19(c) Find $f^{-1}(x)$.

$$f(x) = 4x^2 - 7$$

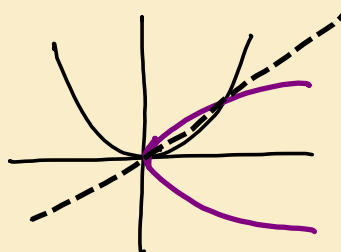
$$x = 4y^2 - 7$$

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

$$\pm \frac{\sqrt{x+7}}{2} = y = f^{-1}(x)$$

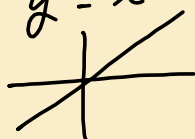
1) Switch x & y

2) Solve for y



Linear

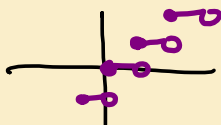
$$y = x$$



$$y = |x|$$

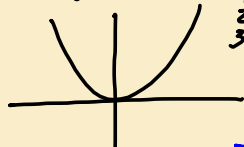


$$y = \lfloor x \rfloor$$



$$y = x^2$$

x	y
0	0
1	1
2	4
3	9



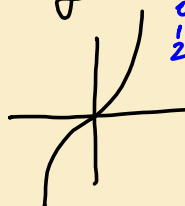
$$y = \sqrt{x}$$

x	y
0	0
1	1
4	2
9	3



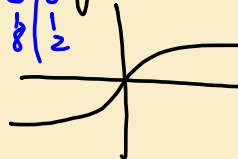
$$y = x^3$$

x	y
0	0
1	1
2	8



$$y = \sqrt[3]{x}$$

x	y
0	0
1	1
8	2



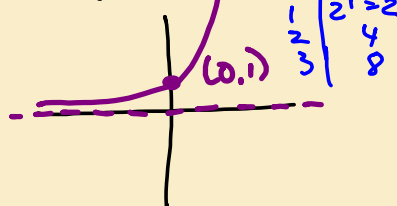
$$y = \frac{1}{x}$$



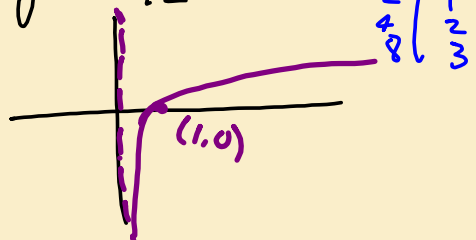
$$y = \frac{1}{x^2}$$



$$y = 2^x$$



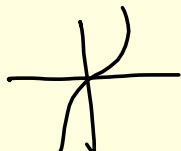
$$y = \log_2 x$$



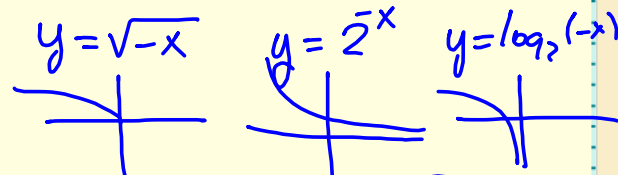
$$y = -\frac{1}{2}(x+9)^3 + 1$$

\uparrow Left 3 \uparrow up
 (Annotations for the cubic function)

x	y
0	0 = 0
1	-1/2
2	-4



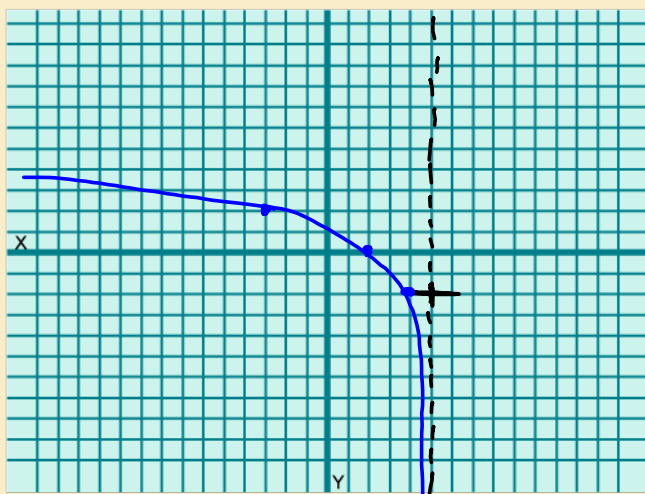
$-f(x)$ flip over x-axis (upside down)
 $f(-x)$ flip over y-axis (sideways flip)



$$y = 2 \log_3 \left(\frac{-(x-5)}{3} \right) - 2$$

Right 5 Down 2
 (Annotations for the logarithmic function)

$3^0 = 1$	0
$3^1 = 3$	+ 2
$3^2 = 9$	+ 4



RATIONAL FUNCTIONS

22/ a) * or ÷ *Keep-change-flip*

$$\frac{3c - c^2}{c^2 - 25} \div \frac{c^2 - 4c + 3}{c^2 + 4c - 5}$$

1) Factor each quantity and cancel

(b) + or - *Common Denoms!*

$$\frac{3}{4} - \frac{2}{3}$$

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

$$\frac{(x-5)4x}{(x-5)(x+2)(x-2)} - \frac{7(x-2)}{(x-5)(x+2)(x-2)}$$

#23 Solve for x.

Has an = sign

↳ multiply by common denom
↓ cancel all denoms

a)

$$\frac{x}{3x+1} - \frac{5}{3x} = \frac{x+4}{3x+1}$$

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

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

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

$$-5 = 26x$$

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

x = speed of wind

$$\frac{4x^2 - 20x - 7x + 14}{(x+2)(x-5)(x-2)}$$

$$\frac{4x^2 - 27x + 14}{(x+2)(x-5)(x-2)}$$

Speed 10 mi/h
Boat = 20 mi/wind
= 6 mi/against

with
against

24	D/R = T	
20	10+x	$\frac{20}{10+x}$
6	10-x	$\frac{6}{10-x}$

Total trip was 7 hours.

$$\frac{20}{10+x} + \frac{6}{10-x} = 7$$

LOGS!!!

#30-34

Like
30

Solve for x.

$$\sqrt[2]{5^x} = \left(\frac{1}{25}\right)^{2x-1}$$

← Make common bases.

$$5^{\frac{x}{2}} = \left(\frac{1}{5^2}\right)^{2x-1}$$

$$5^{x/2} = (5^{-2})^{2x-1}$$

$$5^{x/2} = 5^{-4x+2}$$

$$2 \left[\frac{x}{2} = -4x + 2 \right]$$

$$x = -8x + 4$$

$$9x = 4$$

$$x = \frac{4}{9}$$

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

$$\log_2 \frac{1}{16} = \log_2 \frac{1}{2^4} = \log_2 2^{-4} = -4$$

$$\ln e^{153} = 153$$

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

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

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

Exponentiate!

Solve for x

$$\log_7 (x+3) - \log_7 x = 2$$

$$\log_7 \left(\frac{x+3}{x}\right) = 2$$

$$\nearrow \log_7 \left(\frac{x+3}{x}\right) = 7^2$$

$$x \cdot \frac{x+3}{x} = 49 \cdot x$$

$$x+3 = 49x$$

$$\frac{3}{48} = \frac{48x}{48}$$

$$\frac{1}{16} = x$$