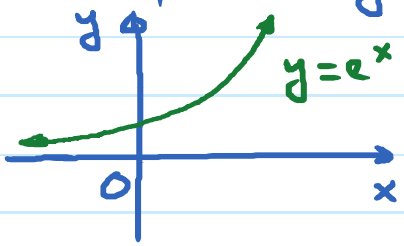
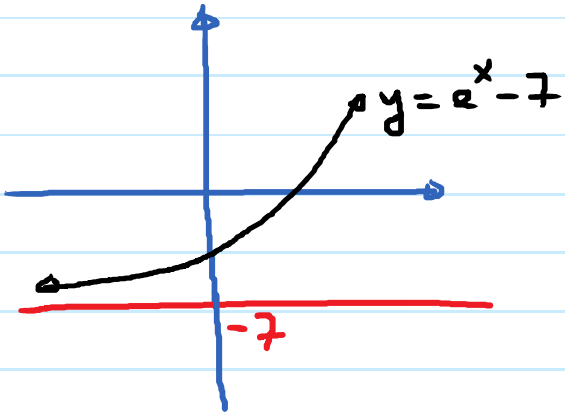
#11 $2\ln a - 9\ln b = \ln a^2 - \ln b^9$ ← Power Rule

$= \ln\left(\frac{a^2}{b^9}\right)$ ← Quotient Rule.

#12 $f(x) = e^x - 7$. Parent function: $y = e^x$



→ 7 units down.



S.A. Section.

#13 $(3, 1)$; $(\frac{4}{5}, 3)$
$x_1\ y_1$ $x_2\ y_2$

$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3-1}{\frac{4}{5} - \frac{3.5}{1.5}} = \frac{2}{\frac{-11}{5}}$

$= \boxed{-\frac{10}{11}}$

#14 $x^2 + y^2 - 6x + 12y = -29$

→ Complete the Square:

$x^2 - 6x + 9 + y^2 + 12y + 36 = -29 + 9 + 36$

$(x-3)^2 + (y+6)^2 = 16$

→ Center of Circle: $\boxed{(3,-6)}$

Radius: $\sqrt{16} = \boxed{4}$

#15 Synthetic Division:

$(2x^5 - x^4 + 3x^2 - x + 5) \div (x-1)$

	2	-1	0	3	-1	5
1		2	1	1	4	3
	2	1	1	4	3	$\boxed{8}$ → R

Quotient: $\boxed{2x^4 + x^3 + x^2 + 4x + 3}$

#16 $f(x) = 8x^3 - 7$. Find the inverse f^{-1}

$y = 8x^3 - 7$ (Replace $f(x)$ by y)

$\rightarrow y + 7 = 8x^3$

$\rightarrow x^3 = \frac{y+7}{8}$

$\rightarrow x = \sqrt[3]{\frac{y+7}{8}}$ (Get x by itself)

$y = \sqrt[3]{\frac{x+7}{8}}$ (Switch y and x)

Answer: $\boxed{f^{-1}(x) = \sqrt[3]{\frac{x+7}{8}}}$ (Replace y by $f^{-1}(x)$)

#17 $\log_{\boxed{w}} \boxed{Q} = \boxed{15}$ → Convert to exp.

(# = Q, exp = 15, base = w)

$\rightarrow \boxed{w^{15} = Q}$

#18 $\log_4\left(\frac{x^2}{y^6}\right) = \log_4 x^2 - \log_4 y^6$ (Quotient Rule)

$= \boxed{2\log_4 x - 6\log_4 y}$ (Power Rule)

#19 $\frac{x+23}{x+1} < 2$

$\frac{x+23}{x+1} - \frac{2\cdot(x+1)}{1\cdot(x+1)} < 0$

$\frac{x+23-2(x+1)}{x+1} < 0$

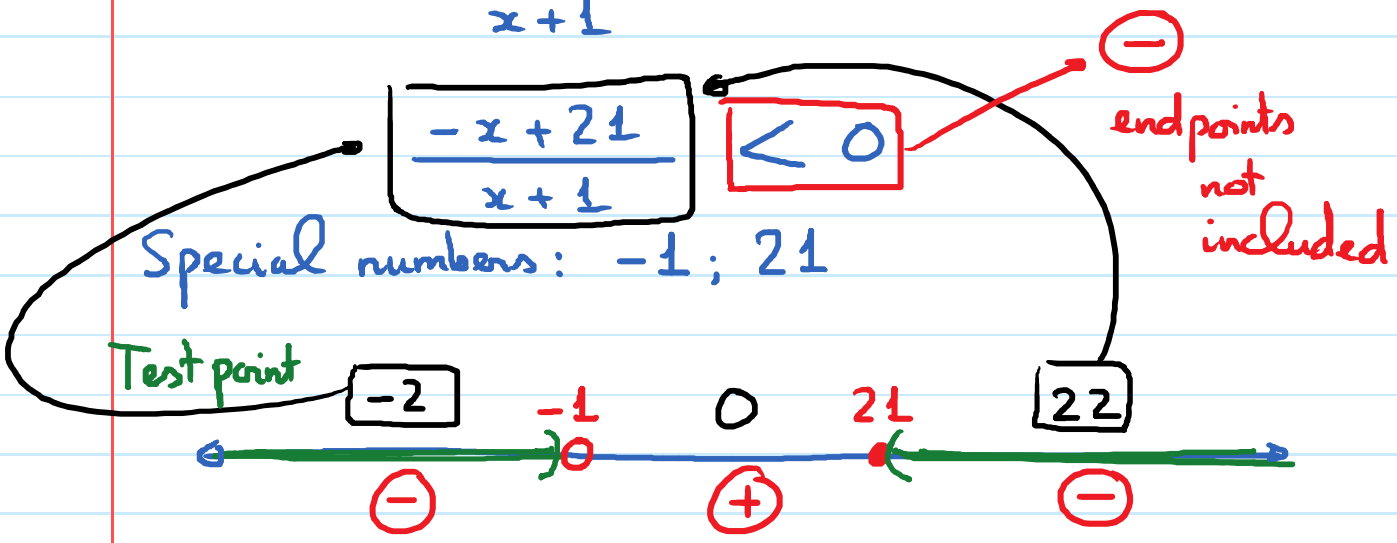
$\frac{x+23-2x-2}{x+1} < 0$

$\frac{-x+21}{x+1} < 0$

endpoints not included

Special numbers: -1; 21

Test point



Solution: $(-\infty, -1) \cup (21, \infty)$

#20 $f(x) = 4x^2+6x+4$

$g(x) = 6x-8$

Find $(g \circ f)(x) = g(f(x))$

$(g \circ f)(x) = 6(4x^2+6x+4) - 8$

Wednesday, May 1, 2019 2:06 PM

$$(g \circ f)(x) = 24x^2 + 36x + 24 - 8$$

$$= \boxed{24x^2 + 36x + 16}$$