$\boxed{1.6, 18}$

(a) The graph satisfies the horizontal line test, so it is 1-to-1. (Or the function is always increasing is another good reason.)

(b) Domain of f is $(-3,3)$, Range of f is $(-1,3)$. So Domain of f^{-1} is $(-1,3)$, Range of f^{-1} is $(-3,3)$

(c) $f^{-1}(2) = 0$

(d) $f^{-1}(0) \approx -1.7$

$\boxed{1.6.25}$ Find the inverse

$y = \ln(x+3)$ (Solve for x).

$e^y = x + 3$

$e^y - 3 = x$

So the inverse of $\ln(x+3)$ is the function $\boxed{e^x - 3}$

$\boxed{1.6.26}$ Find inverse

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

$y(1+2e^x) = e^x$

$y + 2ye^x = e^x$

$y = e^x - 2ye^x$

$y = e^x(1-2y)$

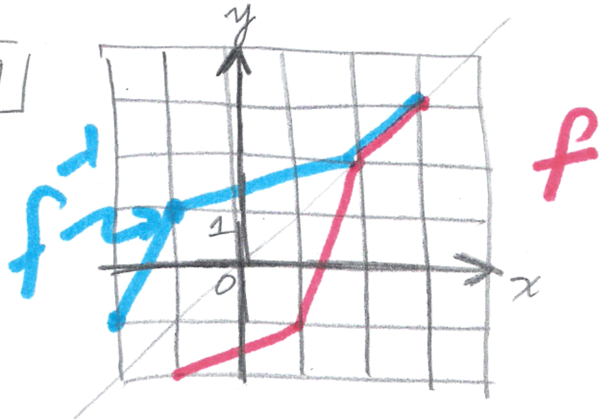
$\frac{y}{1-2y} = e^x$

$\ln\left(\frac{y}{1-2y}\right) = x$

$\ln(y) - \ln(1-2y) = x$

So the inverse of $\frac{e^x}{1+2e^x}$ is the function $\boxed{\ln x - \ln(1-2x)}$.

$\boxed{1.6.29}$



$\boxed{1.6.35}$ Exact value of

(a) $\log_2 6 - \log_2 15 + \log_2 20 = \log_2\left(\frac{6 \cdot 20}{15}\right) = \log_2(8) = 3$

(b) $\log_3 100 - \log_3 18 - \log_3 50 = \log_3\left(\frac{100}{18 \cdot 50}\right) = \log_3\left(\frac{1}{9}\right) = -2$

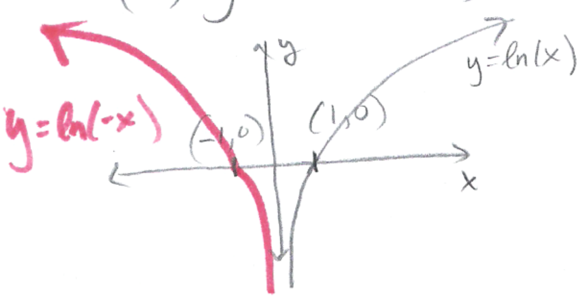
$\boxed{1.6.36}$ Exact value of

(a) $e^{-2\ln 5} = e^{\ln 5^{-2}} = 5^{-2} = \frac{1}{25}$

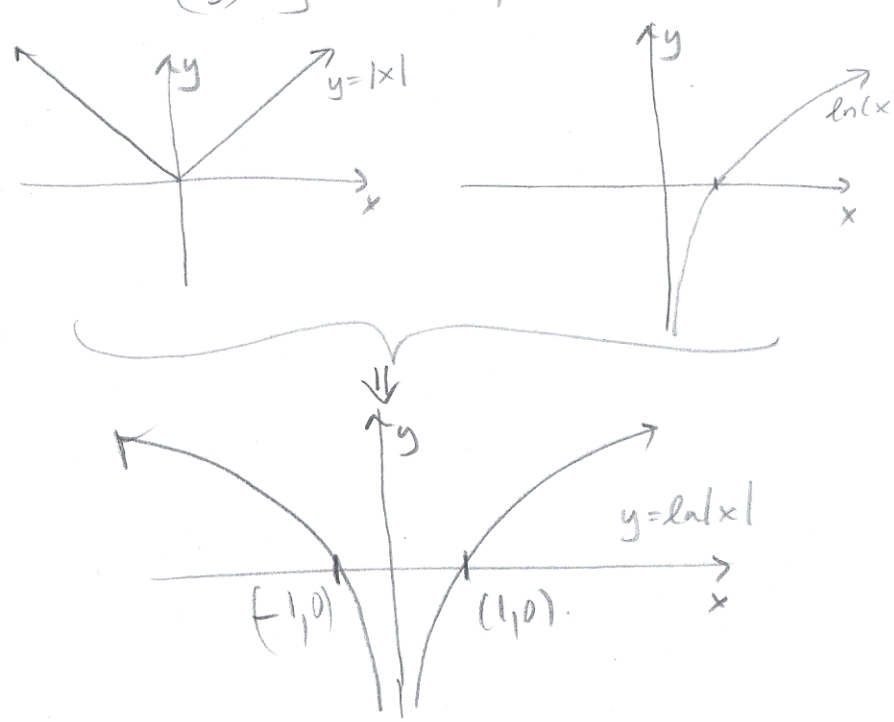
(b) $\ln(\ln e^{e^{10}}) = \ln(e^{10}) = 10.$

$\boxed{1.6.46}$ Rough sketch

(a) $y = \ln(-x)$



(b) $y = \ln|x|$



$\boxed{1.6.49}$ Solve for x.

(a) $2^{x-5} = 3$

$\ln 2^{x-5} = \ln 3$

$(x-5)\ln 2 = \ln 3$

$x-5 = \frac{\ln 3}{\ln 2}$

$x = 5 + \frac{\ln 3}{\ln 2}$

(b) $\ln x + \ln(x-1) = 1$

$\ln(x(x-1)) = 1$

$x(x-1) = e^1$

$x^2 - x - e = 0$

$x = \frac{1 \pm \sqrt{1+4e}}{2}$

$\boxed{1.6.50}$ Solve for x.

(a) $\ln(\ln x) = 1$

$\ln x = e$

$x = e^e$

(b) $e^{ax} = Ce^{bx}$ $a \neq b$

$\ln(e^{ax}) = \ln(Ce^{bx})$

$ax = \ln C + \ln e^{bx}$

$ax = \ln C + bx$

$ax - bx = \ln C$

$(a-b)x = \ln C$

$x = \frac{\ln C}{a-b}$