

Solving

no calculator

1.  $e^x = e^{x^2-2}$

$$x = x^2 - 2$$

$$0 = x^2 - x - 2$$

$$0 = (x-2)(x+1)$$

$$\boxed{x=2}$$

$$\boxed{x=-1}$$

2.  $4^x = 32^{x-2}$

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

$2x = 5x - 10$

$-3x = -10$

$\boxed{x=10/3}$

3.  $\log_4(x-7) = \log_4(2x+3)$

$x-7 = 2x+3$

$-10 = x$

plug in:

$\log_4(-17)$

 $\boxed{\text{no solution}}$ 

4.  $\log(2x+5) = \log(x+9)$

$2x+5 = x+9$

$\boxed{x=4}$

techniques

\* common bases

\* change of base

\* exp  $\leftrightarrow$  log forms

with calculator

5.  $3(2^x) = 42$

get base alone  $2^x = 14$

change  $\log_2 14 = x$

$x = \frac{\log 14}{\log 2}$

$\boxed{x \approx 3.807}$   
approx

6.  $e^x + 5 = 60$

$e^x = 55$

$\ln 55 = x$  exact

$\boxed{x \approx 4.007}$  approx

7.  $e^x = 5$

$\ln 5 = x$

$\boxed{x \approx 1.609}$

8.  $2(3^{2x-5}) = 12$

$3^{2x-5} = 6$

$\log_3 6 = 2x-5$

$\frac{\log 6}{\log 3} + 5 = 2x$

$\boxed{x \approx 3.315}$

$\frac{\log 6}{\log 3} + 5 / 2 = x$

9.  $\ln x = 7$

$e^7 = x$

$\boxed{x \approx 1096.633}$

10.  $2 \log_5 3x = 4$

$\log_5 3x = 2$

$5^2 = 3x$

$25 = 3x$

$\boxed{25/3 = x}$

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