

August 27, 2024

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1) a) $7^0 = \boxed{1}$

b) $10^2(2^{-2} + 5^{-2})$

$100(.29)$

$\boxed{29}$

c) $\frac{(43)^9}{(43)^9}$

$\boxed{1}$

d) $27^{4/3}$

$3\sqrt[3]{27^4} = \boxed{81}$ ✓

e) $8^{-1/3} \cdot 8^{5/3}$

$\sqrt[3]{8^{-1}} \cdot \sqrt[3]{8^5}$

$\frac{1}{2} \cdot 32$

$\boxed{16}$

f) $3 \cdot 4^{1/4} \cdot 12 \cdot 2^{-3/2}$

$3\sqrt[4]{2} \cdot 12 \cdot \frac{1}{2\sqrt{2}}$

~~$\frac{3}{2}\sqrt{2} = \frac{12}{2}\sqrt{2} = 6\sqrt{2}$~~ $\boxed{0}$

6) $(\sqrt{5})^x = 125$

$5^{1/2 x} = 5^3$

$\frac{1}{2}x = 3$

$\boxed{x = 6}$

7) $4^{-x} = 2^{x+1}$

$(2^2)^{-x} = 2^{x+1}$

$-2x = x+1$

$\boxed{x = -1/3}$

8) $b^4 = 10^{12}$

$b^4 = (10^3)^4$

$b = 10^3$ $\boxed{b = 1000}$

2) $9^{2x} = 9^8$

$2x = 8$

$\boxed{x = 4}$ ✓

9) $k^{3/2} = 27$

$k^{3/2} = 9^{3/2}$

$\boxed{k = 9}$ ✓

3) $e^{2x} = e^{x+1}$

$2x = x+1$

$\boxed{x = 1}$

10) $(b^2)^{x+1} = b^{-6}$

$2x+2 = -6$

$\boxed{x = -4}$

4) $e^{t^2} = e^{4t-3}$

$t^2 = 4t-3$

$t^2 - 4t + 3$

$(t-3)(t-1)$

$\boxed{t = -3, 1}$

25) $7e^{5t} = 100$

$e^{5t} = 14.2$

$5t = 2.7$

$\boxed{t = .53}$ ✓

5) $3^x = (1/3)^{x+1}$

$3^x = (3^{-1})^{x+1}$

$x = -x-1$

$\boxed{x = -1/2}$ ✓

$$26) 6e^{-4t} = 2$$

$$e^{-4t} = \ln \frac{1}{3}$$

$$-4t = -1.09 \ln \left(\frac{1}{3}\right) = -1.09$$

✓ $t = .27$ can do
it both

$$27) 2^{x^2-2x} = 8$$

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

$$x^2 - 2x - 3$$

$$(x-3)(x+1)$$

$$x = 3, -1$$

$$f) 3 \cdot 4^{1/4} - 12 \cdot 2^{-3 \cdot 2}$$

$$3 \cdot 4\sqrt{4} - 12 \cdot \frac{1}{(2^{1/2})^3}$$

$$3\sqrt{2} - \frac{12}{2\sqrt{2}}$$

$$3\sqrt{2} - \frac{12\sqrt{2}}{4}$$

$$3\sqrt{2} - 3\sqrt{2}$$

$$\boxed{0}$$