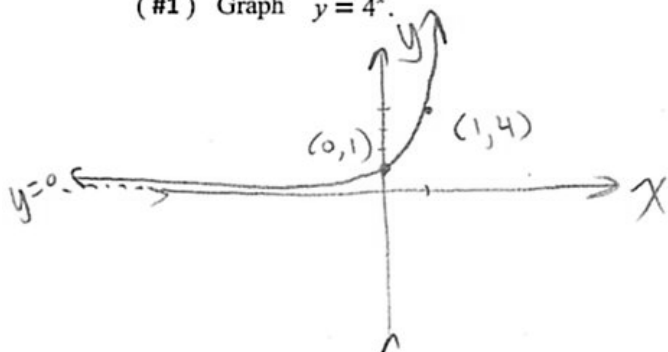


# Pre-Calculus Chapter 3 Practice Test

Name: KEY

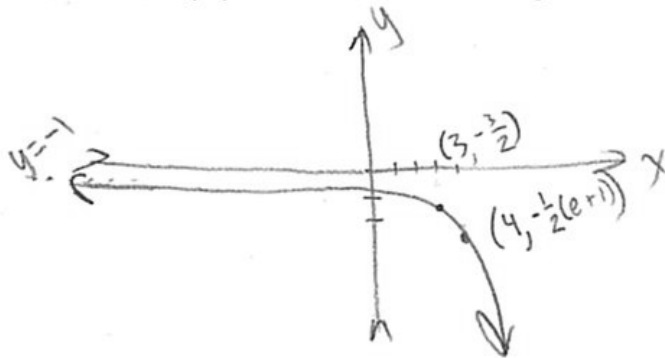
Work together. Get everything right. You may use this during your Chapter 3 Test, but you will not be submitting it for points. You can expect your test to contain problems like these. Keep your writing small.

(#1) Graph  $y = 4^x$ .



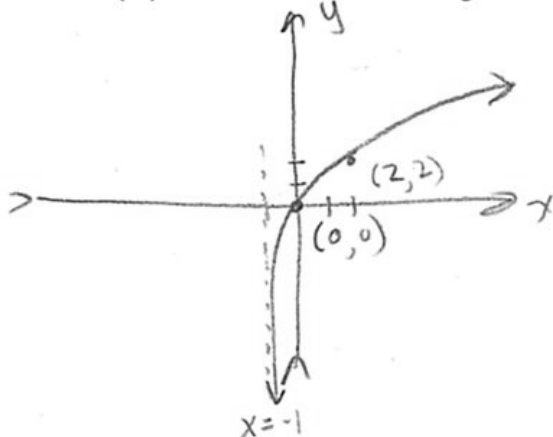
(#2) Graph  $y = -\frac{1}{2}e^{x-3} - 1$ .

- Label the two points corresponding to (0,1) and (1,e) on its parent curve.
- Label any asymptotes.
- State its domain and range.



(#3) Graph  $y = 2\log_3(x+1)$ .

- Label the two points corresponding to (1,0) and (b,1) on its parent curve.
- Label any asymptotes.
- State its domain and range.



(#4) How much time would it take for a principal deposit of \$1200 to double if it were compounded continuously at 4.5% annually?

$$2400 = 1200 e^{0.045t}$$

$$2 = e^{0.045t}$$

$$\ln(2) = \ln(e^{0.045t})$$

$$\ln(2) = 0.045t$$

$$\frac{\ln(2)}{0.045} = t \quad t \approx 15.4$$

15y 21w 7h 5m

(#5) Expand  $\log_4\left(\frac{36a^3b}{5c}\right)$ .

$$= \log_4(36) + \log_4(a^3) + \log_4(b) - \log_4(5) - \log_4(c)$$

$$= 2\log_4(3) + 1 + 3\log_4(a) + \log_4(b) - \log_4(5) - \log_4(c)$$

(#6) Expand  $\ln\left(\frac{4e^{3x}}{(2e^x)^2 e^x}\right)$ .

$$= \ln(4) + \ln(e^{3x}) - \ln(2e^x) - \ln(2e^x) - \ln(e^x)$$

$$= \ln(4) + 3x - \ln(2) - x - \ln(2) - x - x$$

$$= \boxed{0}$$

(#7) Condense the following expression:

$$2 + \frac{2x}{3} \log_7(e) - 5 \log_7(x) + \frac{1}{2} \log_7(y)$$
$$= \log_7(7^2) + \log_7(e^{\frac{2x}{3}}) - \log_7(x^5) + \log_7(y^{\frac{1}{2}})$$
$$= \boxed{\log_7 \left( \frac{49 \sqrt[3]{e^{2x}} \sqrt{y}}{x^5} \right)}$$

(#8) Condense the following expression:

$$x^2 - 3x + \frac{3}{5} \ln(c+2) - 2 \ln(d) + \frac{4}{5} \ln(b)$$
$$= \ln(e^{x^2}) - \ln(e^{3x}) + \ln(\sqrt[5]{(c+2)^3}) - \ln(d^2) + \ln(\sqrt[5]{b^4})$$
$$= \boxed{\ln \left( \frac{e^{x^2} \sqrt[5]{(c+2)^3} b^4}{e^{3x} d^2} \right)}$$

(#9) Solve  $e^{2x} + 6e^x = 16$

$$(e^x)^2 + 6e^x - 16 = 0$$
$$(e^x + 8)(e^x - 2) = 0$$
$$e^x + 8 = 0 \quad \text{or} \quad e^x - 2 = 0$$
$$\cancel{e^x = -8} \quad \text{or} \quad e^x = 2$$
$$\ln(e^x) = \ln(2)$$
$$\boxed{x = \ln(2)}$$

(#10) Solve  $\frac{128}{e^{4x^2+1}-8} = 32$

$$\frac{128}{32} = e^{4x^2+1} - 8$$
$$4 = e^{4x^2+1} - 8$$
$$12 = e^{4x^2+1}$$
$$\ln(12) = \ln(e^{4x^2+1})$$
$$\ln(12) = 4x^2 + 1$$
$$\frac{\ln(12) - 1}{4} = x^2$$
$$\boxed{\frac{\sqrt{\ln(12)-1}}{2} = x \quad \text{or} \quad -\frac{\sqrt{\ln(12)-1}}{2} = x}$$
$$0.6093 \approx x \quad \text{or} \quad -0.6093 \approx x$$