

4.1 to 4.3 Exam Review

NO CALCULATORS

Describe the transformation from $y = 2^x$

1. $y = 2^x + 3$ 2. $y = -2^x - 3$ 3. $y = 2^{x-2} + 1$
- up 3* *flipped x-axis ↓* *Right 2 and up ↑ 1*
- down 3*

Write into the "other" form.

4. $2^{-3} = \frac{1}{8}$ $\log_2 \frac{1}{8} = -3$ 5. $\log_2 \frac{1}{64} = -6$ $2^{-6} = \frac{1}{64}$

Simplify each log.

5. $\log_3 \frac{1}{9}$ -2 6. $\log_4 4^0$ 0 7. $\log_8 4 = x$ $\frac{2}{3}$
- $\log_3 3^{-2}$* *$4 = 8^x$ $2^2 = 2^{3x}$*
8. $\log_{10} 0.00001$ -5 9. $\log_{\sqrt{7}} \frac{1}{49} = x$ -4 10. $\log_2 \frac{1}{8}$ -3
- $\log_{10} 10^{-5}$* *$\cancel{7^{-2}} = \cancel{7}^{1/2x}$* *$\log_2 2^{-3}$*

Solve.

11. $\log_4 x = 3$ 64 12. $\log_{\sqrt{3}} 9 = x$ 4 13. $\log_{27} x = -\frac{4}{3}$ $\frac{1}{81}$
- $x = 4^3$* *$3^2 = 3^{1/2x}$* *$x = 3^{\cancel{2} \cdot -\frac{4}{3}} = 3^{-4} = \frac{1}{3^4}$*
14. $\log_{\frac{1}{2}} x = -3$ 8 15. $\log_x 16 = \frac{1}{2}$ 256 16. $\log_x \frac{1}{100} = -2$ 10
- $x = (\frac{1}{2})^{-3} = 2^3$* *$16 = x^{1/2}$* *$\frac{10^2}{10^{-2}} = x^{-2}$*
17. $\log_9 9^4$ 4 ★ 18. $\frac{1}{4} = 8$ $-\frac{3}{2}$ ★ 19. $3^{-x} = 81$ -4
- $\cancel{x^{-2x}} = \cancel{x}^3$* *$3^{-x} = 3^4$*

CALCULATORS

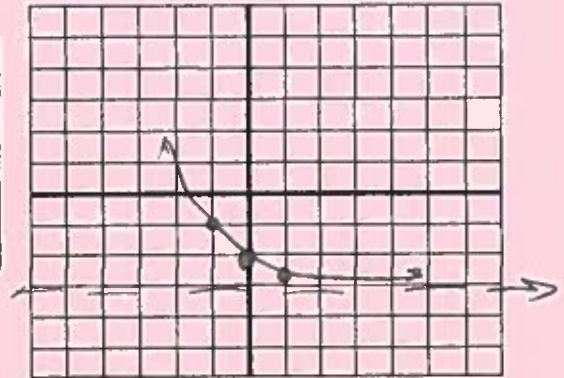
Graph the equation. Describe the transformation. State the Domain, Range and Asymptote.

1. 20) $y = 2^{-x} - 3$

D: $(-\infty, \infty)$
 R: $(3, \infty)$
 A: $y = -3$

flipped \leftarrow y axis
 & down 3 \downarrow

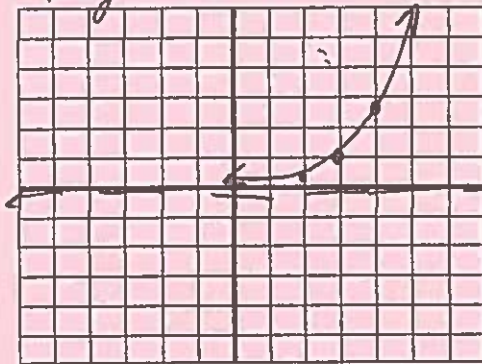
| x | y |
|----|--------|
| -1 | -1 |
| 0 | -2 |
| 1 | -2 1/2 |
| | |



2. 21) $y = e^{x-3}$

Right 2 \rightarrow

| x | y |
|---|-------|
| 4 | 2.718 |
| 3 | 1 |
| 2 | .368 |
| | |



D: $(-\infty, \infty)$
 R: $(0, \infty)$
 A: $y = 0$

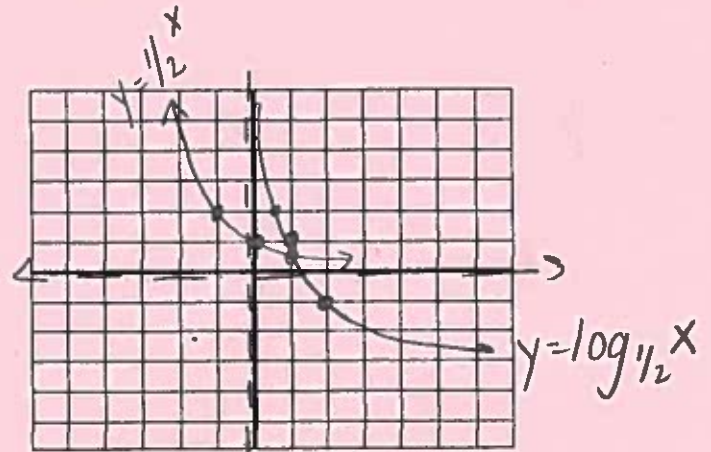
3. 22) $y = \frac{1}{2}^x$ and $y = \log_{\frac{1}{2}} x$ on the same axes.

| x | y |
|----|-----|
| -1 | 2 |
| 0 | 1 |
| 1 | 1/2 |
| | |

4.3

| x | y |
|-----|----|
| 2 | -1 |
| 1 | 0 |
| 1/2 | 1 |
| | |

"inverse"



D: $(-\infty, \infty)$
 R: $(0, \infty)$
 A: $y = 0$

D: $(0, \infty)$
 R: $(-\infty, \infty)$
 A: $x = 0$

Solve. p

1. 23. \$1000 is invested as 12% interest and compounded quarterly. Determine how much the investment is worth after 10 years. $t = 10$

$.12 = r$ $n = 4$

$$A = 1000 \left(1 + \frac{.12}{4} \right)^{(4 \cdot 10)} = \boxed{\$3,262.04}$$

2. 24. Find the amount after 3 years and 3 months if \$1000 is invested at an interest rate of 1.2% per year, compounded continuously.

$3 \text{ years} + 3 \text{ months} = 3 \frac{1}{4} \text{ years} = 3.25 \text{ years}$

$$A = 1000 e^{.012 \cdot 3.25} = \boxed{\$1,039.77}$$