

BE - Alg. 2 | Wednesday 3-31-10

① List the 7 exponent rules.

② $X^{4N} \cdot X^{2N} = ?$

③ $(X^{-2})^{4N+1} = ?$

④ $27^{\frac{2}{3}} = ?$

⑤ DEFINE AN EXPONENTIAL FUNCTION

• Homework review

Alg. 2 Homework Review: Pg 527-528
2-10, 16, 18.

② ① $y = 3x^2$ QUADRATIC

③ $y = 4(3)^x$ EXPONENTIAL → growth

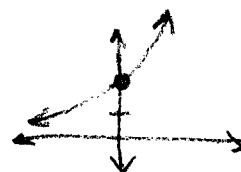
④ $y = 2x + 4$ LINEAR

⑤ $y = 4(0.2)^x + 1$ EXPONENTIAL → decay
↑
vertical shift

⑥ ① $y = 5^x$



⑦ ② $y = 2(5)^x$

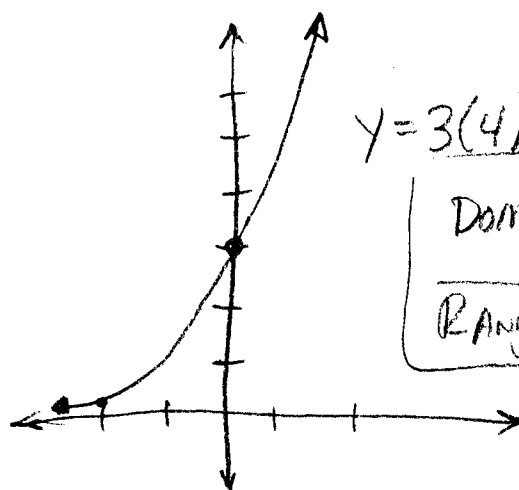


⑧ ③ $y = (\frac{1}{5})^x$



⑨ $y = 3(4)^x$

X	Y
-2	$3(4)^{-2} = 3(\frac{1}{16}) = \frac{3}{16}$
-1	$3(4)^{-1} = \frac{3}{4}$
0	3
1	12
2	48



$y = 3(4)^x$

Domain: {All Reals}

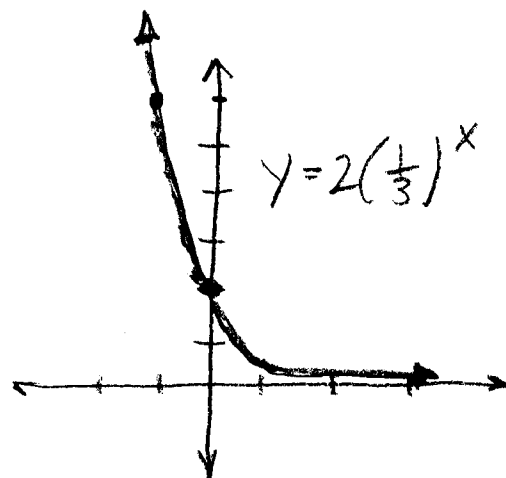
Range: $\{y | y > 0\}$

$$\textcircled{7} \quad y = 2\left(\frac{1}{3}\right)^x$$

Domain: {All Reals}

Range: $\{y \mid y > 0\}$

x	y
-2	$2\left(\frac{1}{3}\right)^{-2} = 2\left(\frac{1}{\frac{1}{9}}\right) = 18$
-1	$2\left(\frac{1}{3}\right)^{-1} = 2\left(\frac{1}{\frac{1}{3}}\right) = 6$
0	2
1	$\frac{2}{3}$
2	$2\left(\frac{1}{3}\right)^2 = 2\left(\frac{1}{9}\right) = \frac{2}{9}$



$$\textcircled{8} \quad y = 2(-7)^x \quad \boxed{\text{GROWTH}} \quad \textcircled{9} \quad y = (0.5)^x \quad \boxed{\text{decay}}$$

$$\textcircled{10} \quad y = 0.3(5)^x \quad \boxed{\text{GROWTH}}$$

$$\textcircled{16} \quad 2^{N+4} = \frac{1}{32}$$

$$2^{N+4} = 2^{-5}$$

$$\therefore N+4 = -5$$

$$\boxed{N = -9}$$

$$\text{CK } 2^{(-9)+4} \stackrel{?}{=} \frac{1}{32}$$

$$2^{-5} = \frac{1}{32} \quad \checkmark$$

$$\textcircled{18} \quad 9^{2y-1} = 27^2$$

$$(3^2)^{2y-1} = (3^3)^2$$

$$3^{4y-2} = 3^{6y}$$

$$\therefore 4y-2 = 6y$$

$$\boxed{y = 2}$$

$$\text{CK: } 9^{2(2)-1} \stackrel{?}{=} 27^2$$

$$9^3 \stackrel{?}{=} 27^2 \quad \checkmark \checkmark$$

$$\begin{array}{r} 27 \\ \times 27 \\ \hline 189 \\ 54 \\ \hline 729 \end{array}$$

$$\begin{array}{r} 81 \\ \times 9 \\ \hline 729 \end{array}$$

Writing An Exponential Function

If you know the "initial value"
(y-intercept)
and one other point on the graph
you can write the exponential function
equation.

ⓔ Write the exponential function that
passes through $(0, 3)$ and $(-1, 6)$.

$(0, 3) \Rightarrow$ y-intercept = "initial" value

$$y = ab^x \quad \therefore 3 = a(b^0)$$

$$3 = a \cdot 1 \quad \therefore \textcircled{a = 3}$$

$$\therefore y = 3b^x$$

Use $(-1, 6)$
x, y

$$6 = 3(b)^{-1}$$

$$6 = \frac{3}{b}$$

$$b \cdot 6 = \frac{3}{b} \cdot b$$

$$\Rightarrow \boxed{y = 3\left(\frac{1}{2}\right)^x}$$

$$\frac{6b}{6} = \frac{3}{6} \quad \therefore \textcircled{b = \frac{1}{2}}$$

Vertical : Horizontal Shifts
($y \updownarrow$) ($x \leftrightarrow$)

Ex) $y = 2^x$

$y = 2^{x-1}$

HORIZONTAL SHIFT
1 unit $\rightarrow$

Ex) $y = 2^x - 1$

Vertical SHIFT
1 unit $\downarrow$

Practice: Next pg. $\Rightarrow$ 5 problems.

Practice - Q4 Week 3

Solve each equation.

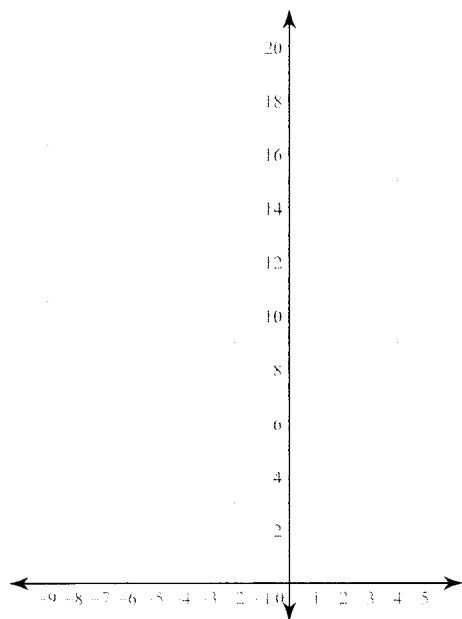
1) $4^{2n-3} = 4^{3n-2}$

2) $\left(\frac{1}{6}\right)^{2m} = 36$

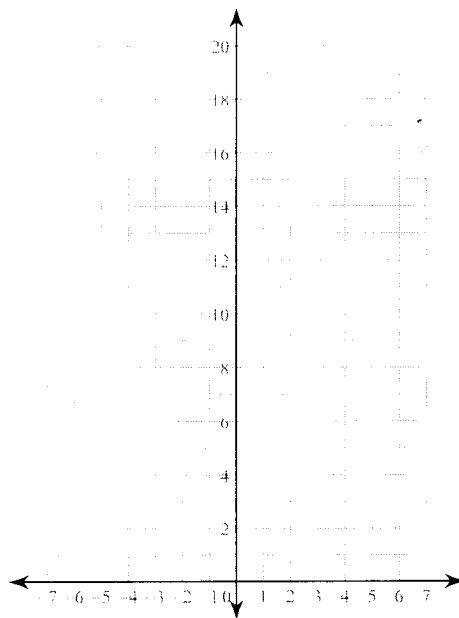
3) $81^{2-2p} \cdot 81^{3p} = \frac{1}{9}$

Sketch the graph of each function.

4) $y = 4 \cdot \left(\frac{1}{2}\right)^{x+2}$



5) $y = 2^x + 1$



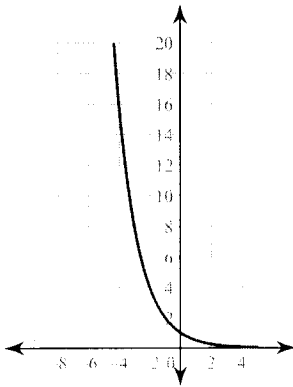
Answers to Practice - Q4 Week 3 (ID: 1)

1) $\{-1\}$

2) $\{-1\}$

3) $\left\{-\frac{5}{2}\right\}$

4)



5)

