

Practice for exp test.doc

$$1. \text{ (a) } 5^{-1}(5^3 - 5^2) \quad \text{(b) } (25^{3/2} + 16^{1/4} - 32^{3/5} + 2)^{-1/2}$$

$$\frac{1}{5}(125 - 25) \quad (125 + 2 - 8 + 2)^{-1/2}$$

$$\frac{1}{5}(100) \quad (121)^{-1/2}$$

$$20 \quad = \frac{1}{121^{1/2}}$$

$$3 \quad = \frac{1}{11}$$

$$2. \text{ (a) } \frac{3^{5n+4} \times 81^{3-2n}}{27^{n+5}}$$

$$\frac{3^{5n+4} \times (3^4)^{3-2n}}{(3^3)^{n+5}}$$

$$\frac{3^{5n+4} \times 3^{12-8n}}{3^{3n+15}}$$

$$\frac{3^{-3n+16}}{3^{3n+15}} = 3^{6n+1} \text{ OR } \frac{1}{3^{-6n-1}}$$

$$\text{(b) } \frac{(7 \times 3a)^3}{7 \times 9a}$$

$$\frac{343 \times 9a^3}{7 \times 9a}$$

$$= 49$$

$$\text{(c) } \left(\frac{32a^{10}b^{12}}{243a^5b^2} \right)^{3/5}$$

$$\frac{32^{3/5} a^{30/5} b^{36/5}}{243^{3/5} a^{15/5} b^{6/5}}$$

$$\frac{8 a^{6} b^{36/5}}{27 a^3 b^6}$$

$$\begin{aligned} \text{(d)} \quad & \frac{-b(2a^4b^3)^3(9a^2b)}{(ba^5b)^2} \\ & \frac{-b(8a^{12}b^9)(9a^2b)}{36a^{10}b^2} \\ & \frac{-432a^{14}b^{10}}{36a^{10}b^2} = 12a^4b^8 \end{aligned}$$

$$\begin{aligned} \text{(e)} \quad & \frac{x^5 \cdot x^{2n}}{(x^2)^{n+1}} \\ & \frac{x^{2n+5}}{x^{2n+2}} \\ & = x^{(2n+5)-(2n+2)} \\ & = x^3 \end{aligned}$$

$$\begin{aligned}
 2. (a) \quad & 64^{x-1} = 32^{2x-3} \\
 & (2^6)^{x-1} = (2^5)^{2x-3} \\
 & 2^{6x-6} = 2^{10x-15} \\
 \therefore & 6x-6 = 10x-15 \\
 & -4x = -9 \\
 & x = \frac{9}{4}
 \end{aligned}$$

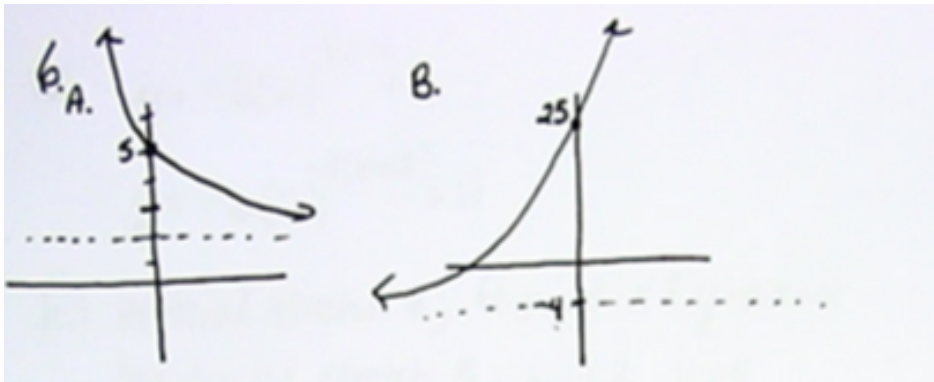
$$\begin{aligned}
 (b) \quad & 81^{2x+3} = (\sqrt[4]{3})^x \\
 & (3^4)^{2x+3} = (3^{\frac{1}{4}})^x \\
 & 3^{8x+12} = 3^{\frac{1}{4}x} \\
 & 8x+12 = \frac{1}{4}x \\
 & 32x+48 = x \\
 & 31x = -48 \\
 & x = \frac{-48}{31}
 \end{aligned}$$

$$\begin{aligned}
 (c) \quad & 25^{5x-4} = \frac{1}{125} \\
 & (5^2)^{5x-4} = \frac{1}{5^3} \\
 & 5^{10x-8} = 5^{-3} \\
 & 10x-8 = -3 \\
 & 10x = 5 \\
 & x = \frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 (d) \quad & 36^{x^2-8} = 6^{11x-4} \\
 & (6^2)^{x^2-8} = 6^{11x-4} \\
 & 6^{2x^2-16} = 6^{11x-4} \\
 & 2x^2-16 = 11x-4 \\
 & 2x^2-11x-12 = 0 \\
 & \text{quad formula}
 \end{aligned}$$

$$\begin{aligned} 4. P &= 6570(1.023)^t \\ &= 6570(1.023)^{97} \\ &= 59635.1 \end{aligned}$$

$$\begin{aligned} 5. V &= 15600(0.82)^t \\ &= 15600(0.82)^5 \\ &= 5783.54 \end{aligned}$$



$$\begin{aligned}
 7. \quad V &= 32500(0.92)^{4/5} \\
 &= 32500(0.92)^{0.8} \\
 &\approx 27508
 \end{aligned}$$

$$\begin{aligned}
 8 \quad M &= 70\left(\frac{1}{2}\right)^{t/20} \quad 4 \text{ hrs} = 240 \text{ min} \\
 &= 70\left(\frac{1}{2}\right)^{240/20} \\
 &= 0.017 \text{ mg}
 \end{aligned}$$

$$\begin{aligned}
 9. \quad B &= 12(3)^{4/5} \\
 &= 12(3)^{0.8} \\
 &\approx 18.6
 \end{aligned}$$

$$10. \quad y = 2(3)^{-(x+4)} - 5$$

VR \times HR \checkmark
 VS 2 HS -
 VT D5 HR L4
 HA $y = -5$

Domain $x \in \mathbb{R}$
 Range $y > -5$
 y-int $2(3)^{-(0+4)} - 5$
 $= 2(3)^{-4} - 5$
 $= \frac{2}{81} - 5$
 $= -4.975$
 HA $y = -5$

$$11. y = -4\left(\frac{1}{2}\right)^{x-3} + 5$$

VR \checkmark HR \times
 VS 4 HS \times
 VT US HT R3

Domain $x \in \mathbb{R}$

Range $y < 5$ (flips vertically)

$$y\text{-int: } -4\left(\frac{1}{2}\right)^{0-3} + 5 \quad \text{HA } y = 5$$

$$-4\left(\frac{1}{2}\right)^{-3} + 5$$

$$-4(2)^3 + 5$$

$$-32 + 5 = -27$$

$$12. y = -6(2)^{-3x-6} + 11$$

$$y = -6(2)^{-3(x+2)} + 11$$

VR \checkmark HR \checkmark
 VS 6 HS $\frac{1}{3}$
 VT Up 11 HT L2

(b) Domain $x \in \mathbb{R}$

Range $y < 11$
(VR)

$$y\text{-int } -6(2)^{-3(0)-6} + 11$$

$$-6(2)^{-6} + 11$$

$$\frac{-6}{64} + 11$$

$$10.9$$

$$\text{HA } y = 11$$

$$13. y = 4^{x+2} - 9$$

VRx HRx
VSx HS
VT D9 HT L2

$$\text{HA } y = -9$$

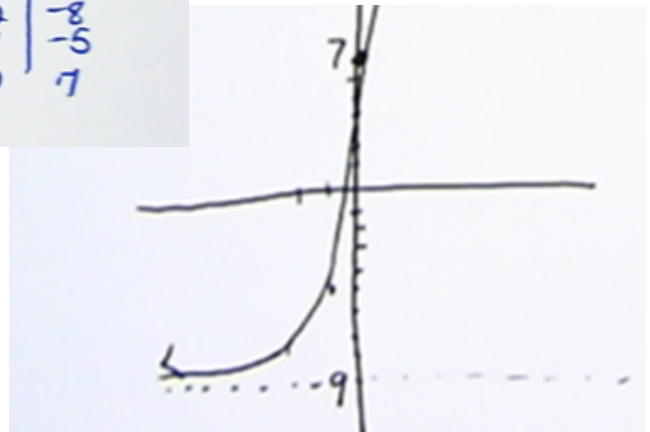
$$\begin{aligned} \text{y-int: } 4^{0+2} - 9 \\ = +16 - 9 \\ = 7 \end{aligned}$$

$$(x, y) \rightarrow (x-2, y-9)$$

$$y = 4^x$$

x	y
-2	1/16
-1	1/4
0	1
1	4
2	16

x	y
-4	-8.9375
-3	-8.75
-2	-8
-1	-5
0	7



14. $y = -\left(\frac{1}{3}\right)^{x-1} + 7$

VRV HRx
 VS - HS
 VT up 7 HT RI
 HA $y = 7$
 y-int $-\left(\frac{1}{3}\right)^{0+1} + 7$
 $= 4$

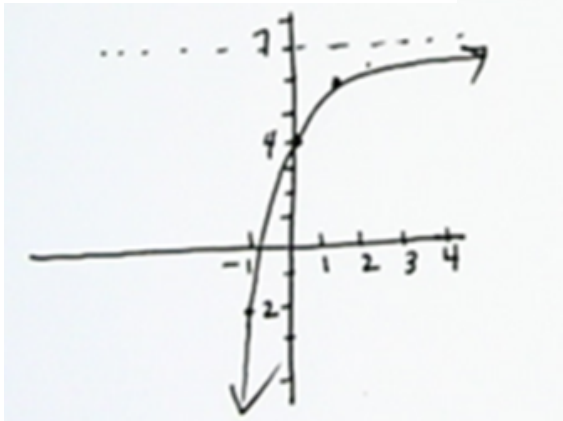
$y = \left(\frac{1}{3}\right)^x$

x	y
-2	9
-1	3
0	1
1	0.3
2	0.111

$y = -\left(\frac{1}{3}\right)^{x-1} + 7$

$(x, y) \rightarrow (x+1, -y+7)$

x	y
-1	-2
0	4
1	6
2	6.7
3	6.9



Attachments

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