

Directions: Show your work neatly and clearly. Answers without adequate justification will not receive full credit. Each problem is worth 10 points.

Solve each equation.

1. $\log_3 \frac{1}{9} = -\frac{2}{3}$ *Group assignment*

$$x^{-\frac{2}{3}} = \frac{1}{9} \quad \leftarrow \text{to have } -5 \text{ only}$$

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

$$\boxed{x = 27}$$

2. $\log_2(x+2) + \log_2 x = 3$ *In class 3/30*

$$\log_2 x(x+2) = 3$$

$$x(x+2) = 2^3$$

$$x^2 + 2x = 8 \quad \leftarrow 3 - 4$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0$$

$$x = -4, \quad \boxed{x = 2} \quad \text{both } -2$$

will not work

3. $3^x = 5^{x-1}$ *Page 413 #13*

$$\log 3^x = \log 5^{x-1}$$

$$x \log 3 = (x-1) \log 5 \quad \leftarrow \text{to have } -5 \text{ only}$$

$$x \log 3 = x \log 5 - \log 5$$

$$x(\log 3 - \log 5) = -\log 5$$

$$x = \frac{-\log 5}{\log 3 - \log 5}$$

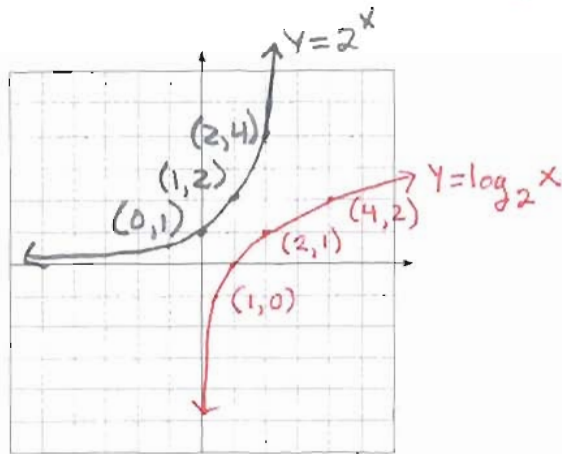
$$\approx \boxed{3.15}$$

$\frac{x}{x+1} = 1.46$
 $\boxed{-3}$

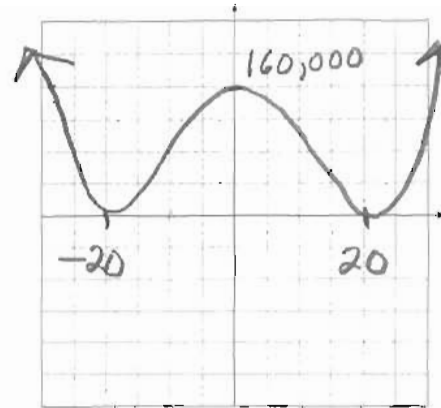
Scale		
90	A	4
80	B	2
60	C	12
50	D	2
↓	F	$\frac{3}{23}$

Group assignment

4. Graph $y = \log_2 x$ and $y = 2^x$ on the same coordinate system. Label 3 points on each graph. -3



5. Graph $f(x) = (x - 20)^2(x + 20)^2$. Label all intercepts accurately. From test 2



Solve each system of equations. If you do not get one unique solution, explain what has happened.

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6.
$$\begin{array}{r} 10x - 3y = 22 \xrightarrow{\times 2} 20x - 6y = 44 \\ 7x + 2y = 40 \xrightarrow{\times 3} 21x + 6y = 120 \\ \hline 41x = 164 \\ x = 4 \\ 7(4) + 2y = 40 \\ 28 + 2y = 40 \\ 2y = 12 \\ y = 6 \end{array}$$

$(4, 6)$

↑
not an ordered pair
-2

7.
$$\begin{array}{r} 0.05x + 0.1y = 0.6 \xrightarrow{\times 100} 5x + 10y = 60 \xrightarrow{\div 5} x + 2y = 12 \\ 3x + 6y = 36 \xrightarrow{\div 3} x + 2y = 12 \end{array}$$

Lines coincide

