## Logarithmic Functions

1. 


2. $y=-\log _{3}(x) \quad y=\log _{3}(x) \quad$ (The graphs are reflections about the $x$-axis)


3. $y=\log _{5}(x)$
4. (a.) 2
(b.) -2
5. (a.) $x=32$
(b.) $x=2$
(c.) $(0,1) \cup(1 \infty)$
6.

7. $y=x^{4}$

$y=\log _{4}(x)$

8. (a.) $9^{2}=x$
(b.) $5^{y}=125$
9. (a.) $\log _{5}\left(\frac{1}{125}\right)=-3$
(b.) $\log _{15}(x)=2$
10. (a.) 3
(b.) $-\frac{1}{2}$
(c.) 1
(d.) 6
11. $f(x)=\left(\frac{1}{2}\right)^{x}$

$$
g(x)=\log _{\frac{1}{2}}(x)
$$



12. (a.) $(-6, \infty)$
(b.) $(-\infty, 7)$
13. What power of 3 is 81 ?
14. Reflect about the line $y=x$

## Distance and Midpoint Formulas

1. Perimeter $=10+10 \sqrt{2}$, Area $=25$
2. (a.) $2 \sqrt{10}$
(b.) 3
3. (a.) $(6,5)$
(b.) $(3 \sqrt{2}, 0)$
4. $x^{2}+y^{2}=64$
5. (a.) Center:(0,0), Radius: 7
(b.) Center: (2, 3), Radius: 4
6. Standard Form: $(x+4)^{2}+(y+2)^{2}=4$, Center: $(-4,-2)$, Radius: 2

Algebra Problem Session \#14 Solutions
7. Complete the square.
8. No, the empty set, assuming $x$ and $y$ are real variables.
9. Yes.

