

$$(11) 8^{a+2} = 3^{3a+1}$$

$$3^{4(a+2)} = 3^{3a+1}$$

$$4a+8 = 3a+1$$

$$a+8 = 1$$

$$\boxed{a = -7}$$

$$(12) 256^{b+2} = 4^{2-2b}$$

$$4^{4(b+2)} = 4^{2-2b}$$

$$4b+8 = 2-2b$$

$$6b+8 = 2$$

$$6b = -6$$

$$\boxed{b = -1}$$

$$(13) 9^{3c-1} = 27^{3c-1}$$

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

$$6c+2 = 9c-3$$

$$-3c+2 = -3$$

$$-3c = -5$$

$$\boxed{c = \frac{5}{3}}$$

$$(14) 8^{2y+4} = 16^{y+1}$$

$$2^{3(2y+4)} = 2^{4(y+1)}$$

$$6y+12 = 4y+4$$

$$2y+12 = 4$$

$$2y = -8$$

$$\boxed{y = -4}$$

$$(20) A = 700 \left(1 + \frac{.043}{12}\right)^{12(7)}$$

$$= 700(1 + .0036)^{84}$$

$$= \boxed{\$946.66}$$

$$(21) A = 5000 \left(1 + \frac{.0605}{54}\right)^{54(20)}$$

$$= 5000(1 + .0011)^{1080}$$

$$= \boxed{\$16,391.86}$$

$$(24) 625 \geq 5^{a+8}$$

$$5^4 \geq 5^{a+8}$$

$$4 \geq a+8$$

$$-4 \geq a, \boxed{a \leq -4}$$

$$(25) 10^{5b+2} > 1000$$

$$10^{5b+2} > 10^3$$

$$5b+2 > 3$$

$$5b > 1$$

$$\boxed{b > \frac{1}{5}}$$

$$\textcircled{26} \left(\frac{1}{64}\right)^{c-2} < 32^{2c}$$

$$2^{-6(c-2)} < 2^{5(2c)}$$

$$-6c + 12 < 10c$$

$$12 < 16c$$

$$\boxed{c > \frac{3}{4}}$$

$$\textcircled{27} \left(\frac{1}{27}\right)^{2d-2} \leq 81^{d+4}$$

$$3^{-3(2d-2)} \leq 3^{4(d+4)}$$

$$-6d + 6 \leq 4d + 16$$

$$-10d + 6 \leq 16$$

$$-10d \leq 10$$

$$\boxed{d \geq -1}$$

$$\textcircled{28} \left(\frac{1}{9}\right)^{3t+5} \geq \left(\frac{1}{243}\right)^{t-6}$$

$$3^{-2(3t+5)} \geq 3^{-5(t-6)}$$

$$-6t - 10 \geq -5t + 30$$

$$-t - 10 \geq 30$$

$$-t \geq 40$$

$$\boxed{t \leq -40}$$

$$\textcircled{29} \left(\frac{1}{36}\right)^{w+2} < \left(\frac{1}{216}\right)^{4w}$$

$$6^{-2(w+2)} < 6^{-3(4w)}$$

$$-2w - 4 < -12w$$

$$-4 < -10w$$

$$\frac{2}{5} > w, \boxed{w < \frac{2}{5}}$$

$\textcircled{43}$  Beth

## Problems

Based on the difference in y-values, identify the graph as linear, quadratic, exponential, or neither.

1. Linear -4

x	-3	-2	-1	0	1	2	3
y	14	10	6	2	-2	-6	-10

2. Exponential ÷2

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{2}$	1	2	4	8	16	32

3. Quadratic

x	-3	-2	-1	0	1	2	3
y	21	12	5	0	-3	-4	-3

4. Linear

x	-3	-2	-1	0	1	2	3
y	-16	-13	-10	-7	-4	-1	2

5. Linear

x	-3	-2	-1	0	1	2	3
y	-14	-9	-4	1	6	11	16

6. Neither

x	-3	-2	-1	0	1	2	3
y	-18	-6	-2	0	2	6	18

7. Exponential

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

8. Exponential

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27

9. Quadratic

x	-3	-2	-1	0	1	2	3
y	30	20	12	6	2	0	0

10. Linear

x	-3	-2	-1	0	1	2	3
y	11	9	7	5	3	1	-1

11. Exponential

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27	81

12. Neither

x	-3	-2	-1	0	1	2	3
y	-27	-9	-3	0	3	9	27

13. Quadratic

x	-3	-2	-1	0	1	2	3
y	0	5	8	9	8	5	0

14. Quadratic

x	-3	-2	-1	0	1	2	3
y	3	0	-1	0	3	8	15

15. Neither

x	-3	-2	-1	0	1	2	3
y	1	0	-1	-2	-1	0	1

16. Exponential

x	-3	-2	-1	0	1	2	3
y	$\frac{9}{8}$	$\frac{9}{4}$	$\frac{9}{2}$	9	18	36	72

## Answers

- |                 |                 |
|-----------------|-----------------|
| 1. linear       | 2. exponential  |
| 3. quadratic    | 4. linear       |
| 5. linear       | 6. quadratic    |
| 7. exponential  | 8. exponential  |
| 9. quadratic    | 10. linear      |
| 11. exponential | 12. neither     |
| 13. quadratic   | 14. quadratic   |
| 15. neither     | 15. exponential |