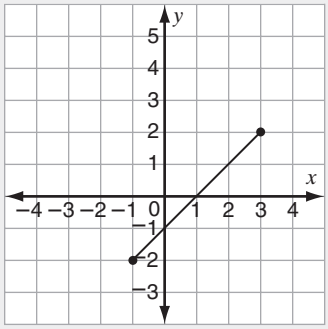
4-1 Introduction to Relations

Name _____ Date _____

Write the domain and range of relation M.



There are infinitely many ordered pairs in this relation.

Domain: $\{x|\ -1 \le x \le 3\}$
Range: $\{y|\ -2 \le y \le 2\}$

You can also represent a relation using a rule. Relation M can be represented by $y = x - 1$.

Find g, if $\left(g, \frac{2}{3}\right)$ belongs to M.

$y = x - 1$

$\frac{2}{3} = g - 1$ ← Substitute g for x and $\frac{2}{3}$ for y.

$\frac{2}{3} + 1 = g - 1 + 1$ ← Add 1 to both sides.

$1\frac{2}{3} = g$

For relation M, an input value of $1\frac{2}{3}$ results in an output value of $\frac{2}{3}$.

Write the domain and range of each relation.

1.

x	y
−3	−1
−2	2
0	5
1	9
4	10

Domain: {−3, −2, 0, 1, 4}
Range: {−1, 2, 5, 9, 10}

2.

x	y
−2	−1
0	0
2	1
4	3
6	5

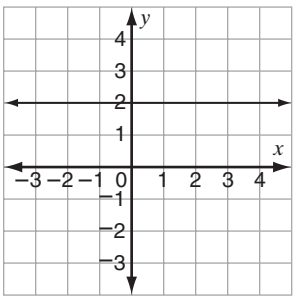
3.

x	y
−1.5	−6
0.5	−4
2.5	−2
3.5	13
4.5	22

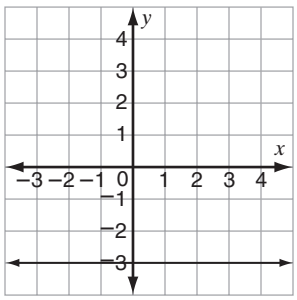
4.

x	y
−3.2	−1
−2.6	0
−2.4	3
3.4	11
5.2	34

5.



6.



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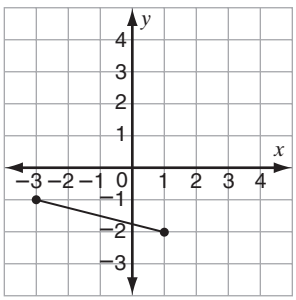


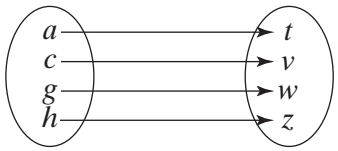
8. the graph of a line segment with endpoints (−2, 3) and (3, −2)

9. the graph of a line segment with endpoints (−4, 1) and (3, 4)

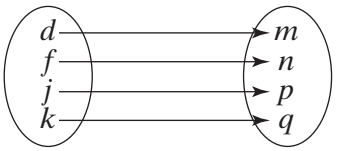
10. the graph of a line that includes points (−2, −2) and (3, 3)

Write the domain and range of each relation.

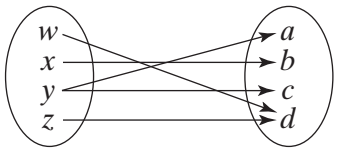
11.



12.



13.



Relation R is represented by the rule $y = -2x^2$. Solve.

14. Does the ordered pair $(-2, 3)$ belong to R?

$y = -2x^2$

$3 \stackrel{?}{=} -2(-2)^2$

$3 \stackrel{?}{=} -2(4) = -8$ False, $3 \neq -8$

No, $(-2, 3)$ is not in R.

15. Does the ordered pair $(1, -2)$ belong to R?

16. Does the ordered pair $(-2, -2)$ belong to R?

17. Does the ordered pair $(-1, -2)$ belong to R?

18. If $(3, b)$ belongs to R, find b.

19. If $(a, -50)$ belongs to R, find a.

20. If $(3c, f)$ belongs to R, find f.

21. If $(5\ell, -k)$ belongs to R, find k.

22. If $(2z, -j)$ belongs to R, find z.

23. If $\left(\frac{1}{2}d, -e\right)$ belongs to R, find d.

CHALLENGE

24. What are the domain and range of this relation?