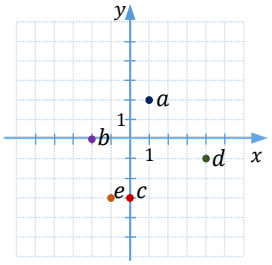
Graphs and Linear Functions - ANSWERS

G1 Exercises

1.

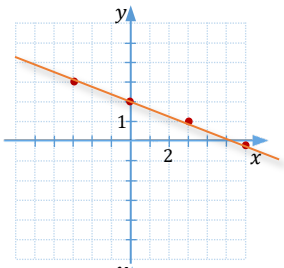


3. yes

5. no

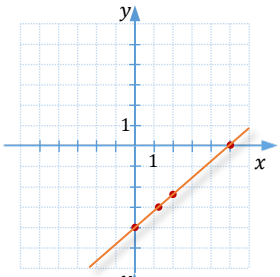
7.

x	y
-3	3
0	2
3	1
6	0



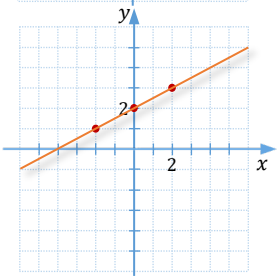
9.

x	y
0	-4
5	0
2	$-\frac{12}{5}$
$\frac{5}{4}$	-3



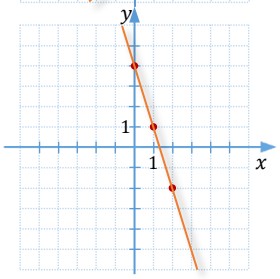
11.

x	y
0	2
2	3
-2	1



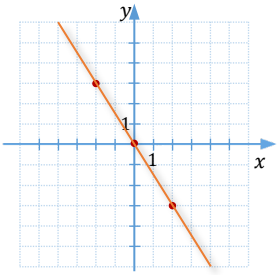
13.

x	y
0	4
1	1
2	-2



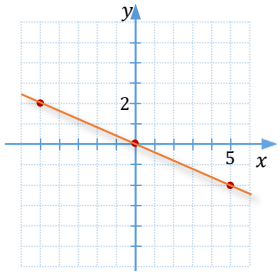
15.

x	y
-2	3
0	0
2	-3



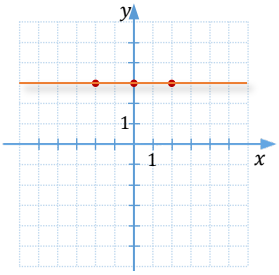
17.

x	y
0	0
5	-2
-5	2



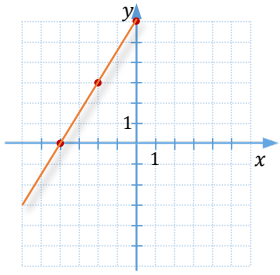
19.

x	y
-2	3
0	3
2	3



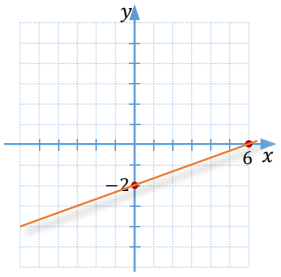
21.

x	y
0	6
-2	3
-4	0



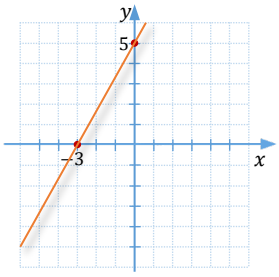
23.

x	y
6	0
0	−2



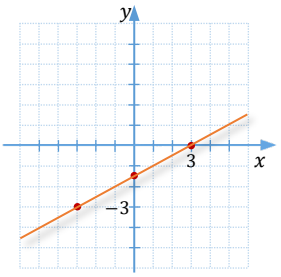
25.

x	y
−3	0
0	5



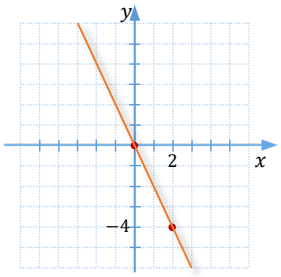
27.

x	y
3	0
0	$-\frac{3}{2}$
−3	−3

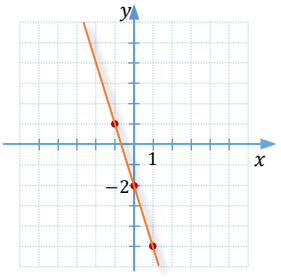


29.

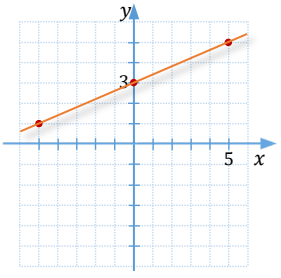
x	y
0	0
2	−4



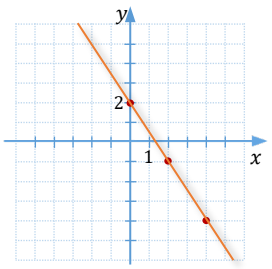
31. y-int. $= (0,-2)$
slope $= -3$



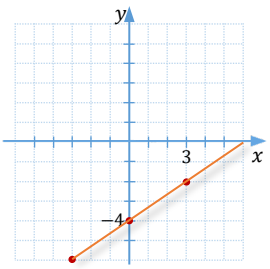
33. y-int. $= (0,3)$
slope $= \frac{2}{5}$



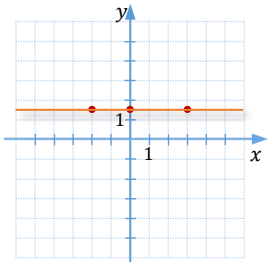
35. y-int. $= (0,2)$
slope $= -\frac{3}{2}$



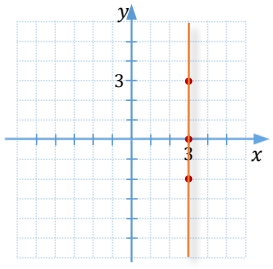
37. y-int. $= (0,-4)$
slope $= \frac{2}{3}$



39. y-int. $= \left(0,\frac{3}{2}\right)$
slope $= 0$



41. y-int. $= none$
slope $= undefined$



43. $\left(\frac{3}{2},0\right)$

45. $\left(-\frac{9}{2},8\right)$

47. $\left(\frac{11}{20},-\frac{17}{12}\right)$

49. $(3,-4)$

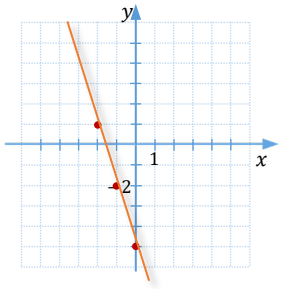
51. $(3,10)$

G2 Exercises

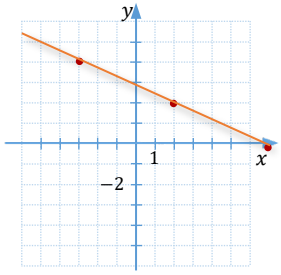
1. $-\frac{1}{3}$ **3.** 4 **5.** $\frac{1}{2}$ **7.** $\frac{4}{5}$

9. undefined **11.** -1 **13.** $\frac{4}{9}$

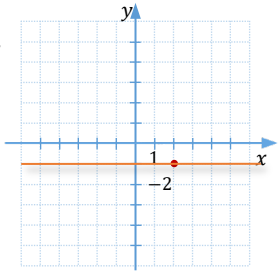
15.



17.



19.



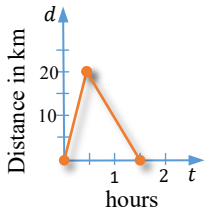
21. $\frac{1}{2}$ **23.** $\frac{2}{3}$ **25.** $-\frac{5}{3}$ **27.** 0

29. 3 **31.** $a-D, b-A, c-C, d-B$

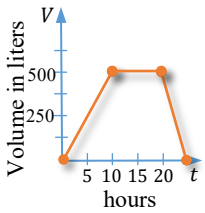
33. For the first 4 years, the pay raise was 0 $\%/year$.

35. On average, between 6 and 16 years old boys grow 4 $cm/year$.

37.



39.



41. 108 km/hr **43.** perpendicular

45. parallel **47.** neither

49. perpendicular **51.** not collinear

G3 Exercises

1. $x+2y=-14$ **3.** $4x-5y=20$ **5.** $4x+6y=-9$ **7.** $y=\frac{1}{6}x-\frac{5}{3}$

9. $y=\frac{4}{5}x-2$ **11.** $y=\frac{2}{5}x-\frac{7}{10}$ **13.** $y=\frac{1}{4}x+2$ **15.** $y=-x+3$

17. $y=\frac{1}{2}x+\frac{7}{2}$
$x-2y=-7$

19. $y=\frac{3}{2}x-1$
$3x-2y=2$

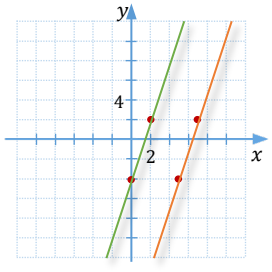
21. $y=-x-3$
$x+y=-3$

23. $y=-\frac{7}{6}x+\frac{4}{3}$
$7x+6y=8$

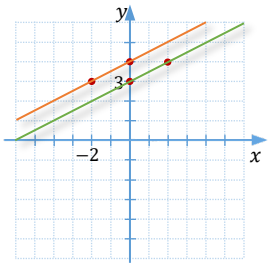
25. $y=\frac{5}{4}x-\frac{1}{3}$
$15x-12y=4$

27. y = 7 **29.** $x=-1$ **31.** $y=6$

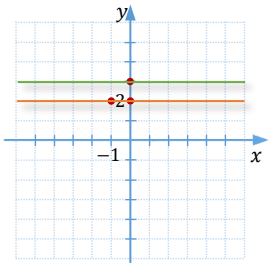
33. $x=-\frac{3}{4}$ **35.** $3x-y=19$



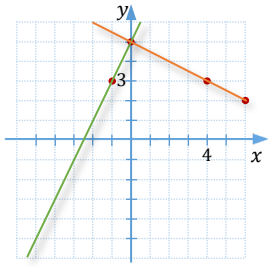
37. $x - 2y = -8$



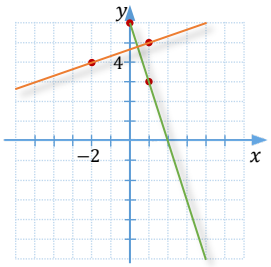
39. $y = 2$



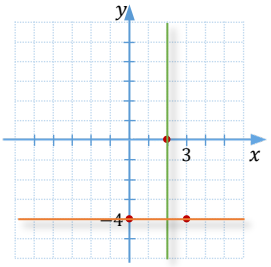
41. $x + 2y = 10$



43. $x - 3y = -14$



45. $y = -4$



47. $C = 49.95n + 80$; \$679.40

49. **a.** $C = 23d + 60$;
b. 6 days

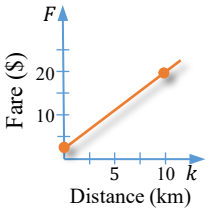
51. $N = \frac{17}{3}t + 8$

53. **a.** $C = 800y - 1581200$;
b. The slope of 800 indicates that the annual tuition and fees for out-of-state students at Oxford University was increasing by \$800/year between 2007 and 2016.
c. \$36400

55. $A = 180t + 2000$

57. **a.** $F = 1.75k + 2.5$
c. the charge per kilometer
d. 12 km

b.



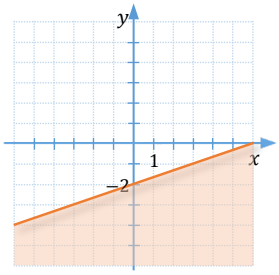
G4 Exercises

1. yes; yes

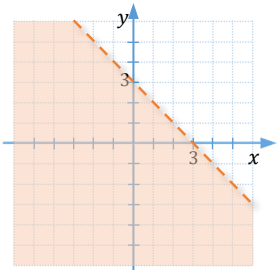
3. no; yes

5. a. – II; b. – IV; c. – I; d. – III;

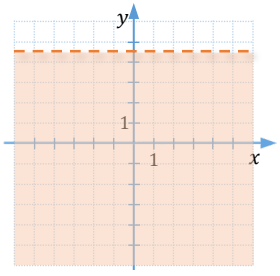
7.



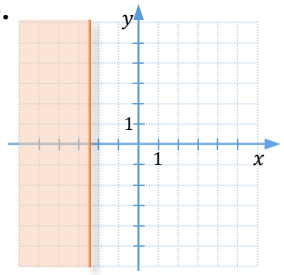
9.



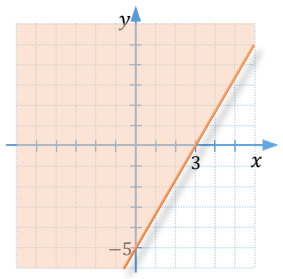
11.



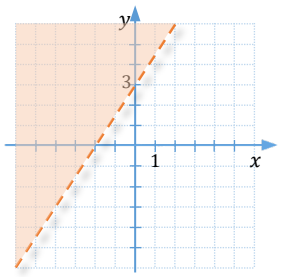
13.



15.



17.



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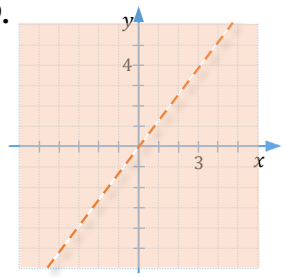


G5 Exercises

1. not a function
domain $= \{0, 2\}$
range $= \{2, 3, 4\}$

3. function
domain $= \{2, 3, 4, 5\}$
range $= \{2, 3, 4, 5\}$

5. not a function
domain $= \{a, b\}$
range $= \{2, 4, 5\}$

7. function
domain $= \{a, b, c\}$
range $= \{2, 4\}$

9. not a function
domain $= \{0, 1\}$
range $= \{-2, -1, 1, 2\}$

11. function
domain $= \{3,6,9,12\}$
range $= \{1, 2\}$

13. function
domain $= \mathbb{R}$
range $= [0,\infty)$

15. function
domain $= \mathbb{R}$
range $= \mathbb{R}$

17. not a function
domain $= \mathbb{R}$
range $= [-4,4]$

19. not a function
domain $= \mathbb{R}$
range $= \mathbb{R}$

21. function
domain $= \mathbb{R}$

23. function
domain $= \mathbb{R}$

25. not a function
domain $= \mathbb{R}$

27. not a function
domain $= [0,\infty)$

29. function
domain $= [0,\infty)$

31. function
domain $= \mathbb{R} \setminus \{-5\}$

33. function
domain $= \mathbb{R} \setminus \{-2\}$

35. not a function
domain $= \mathbb{R}$

37. not a function
domain $= \mathbb{R}$

39. function
domain $= \mathbb{R}$

41. not a function
domain $= [-2,2]$

G6 Exercises

1. **a.** 2 **b.** 3

3. **a.** 1 **b.** $\{-1,0\}$

5. **a.** 4 **b.** 2

7. **a.** -1 **b.** $\{-5,1\}$

9. $f(1) = 2$

11. $g(-1) = -4$

13. $f(p) = -3p + 5$

15. $g(-x) = -x^2 - 2x - 1$

17. $f(a + 1) = -3a + 2$

19. $g(x - 1) = -x^2 + 4x - 4$

21. $f(2 + h) = -3h - 1$

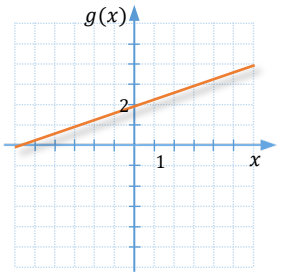
23. $g(a + h) = -a^2 - 2ah - h^2 + 2a + 2h - 1$

25. $f(3) - g(3) = 0$

27. $3g(x) + f(x) = -3x^2 + 3x + 2$

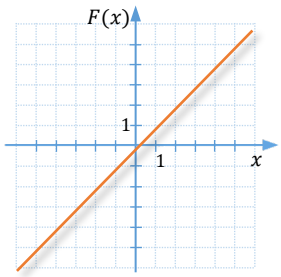
29. line; 4; $-2x + 6$; 4; (1,4)

31.



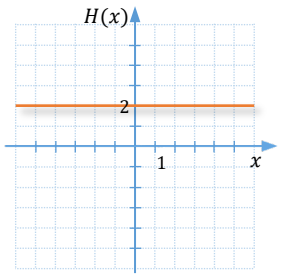
domain $= \mathbb{R}$
range $= \mathbb{R}$

33.



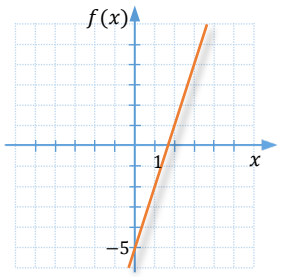
domain $= \mathbb{R}$
range $= \mathbb{R}$

35.



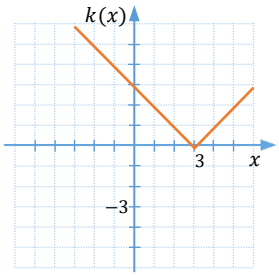
domain $= \mathbb{R}$
range $= \{2\}$

37.



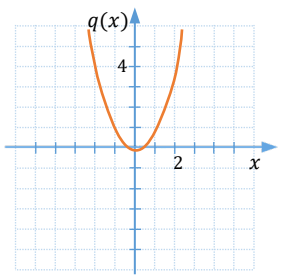
domain $= \mathbb{R}$
range $= \mathbb{R}$

39.



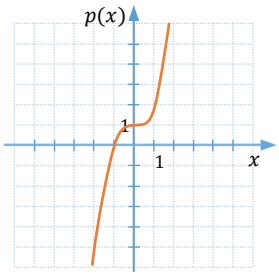
domain $= \mathbb{R}$
range $= [0, \infty)$

41.



domain $= \mathbb{R}$
range $= [0, \infty)$

43.



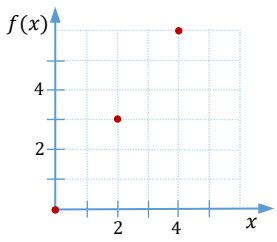
domain $= \mathbb{R}$
range $= \mathbb{R}$

45. **a.**

x	$f(x)$
0	0
2	3.00
4	6.00

b. $f(x) = 1.5x$

c.



47. **a.** $C(d) = 24.6d + 18.8$ **b.** $C(4) = 117.20$; The cost of renting the car for 4 days is \$117.20.
c. $d = 7$; A rental of 7 days costs \$191.

49. **a.** $t \in [0,20]$; $f(t) \in [0,600]$ **b.** 5 minutes; 10 minutes **c.** 600 meters
d. $f(15) = 300$; After 15 minutes, the person is 300 meters from home.

51. The height of water in the bathtub decreases quickly, then remains constant, and finally increases slowly until it reaches half of the original height.