

Functions

1. Given $f(x) = 2x^2 + 7x + 9$ and $g(x) = 4 - 5x$, find the following:

- (a) $f(-1)$
- (b) $g(-2)$
- (c) the values of x for which $g(x) = 0$
- (d) $f(2) - g(-2)$

2. Given $f(x) = -3x^2 + 2x + 4$, find the following:

- (a) $f(-2)$
- (b) $f(2) - f(1)$
- (c) the values of x for which $f(x) = 4$

3. Given $f(x) = -x^2 - 6x + 16$ and $g(x) = 2 - 5x$, find the following:

- (a) $f(-2)$
- (b) the values of x for which $f(x) = 0$
- (c) $f(\frac{1}{2}) - g(\frac{1}{5})$

4. Given $f(x) = x^2 + 5x$ and $g(x) = 2 - 5x$, find the following:

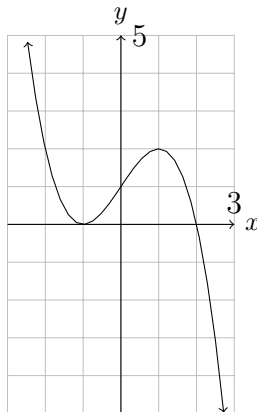
- (a) $f(\frac{1}{2})$
- (b) the values of x for which $f(x) = 0$
- (c) $f(-2) - g(\frac{1}{3})$

5. Given $f(x) = x^2 + 6x + 4$, find the following:

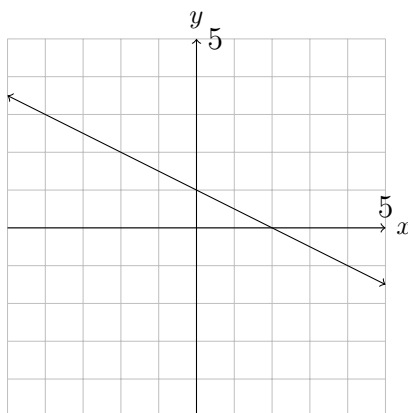
- (a) $f(2)$
- (b) $f(\frac{1}{3})$
- (c) $f(a + h)$
- (d) the values of x for which $f(x) = -4$

[6-13] Find the (a) domain, (b) range, (c) intercepts, (d) sign, and (e) local extrema of the following functions.

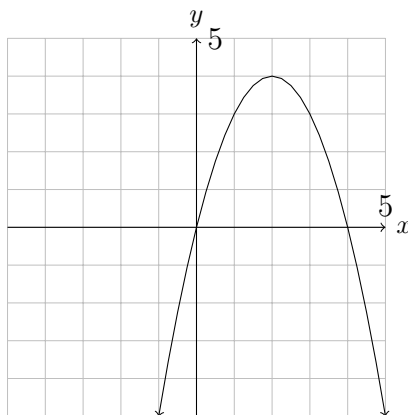
6.



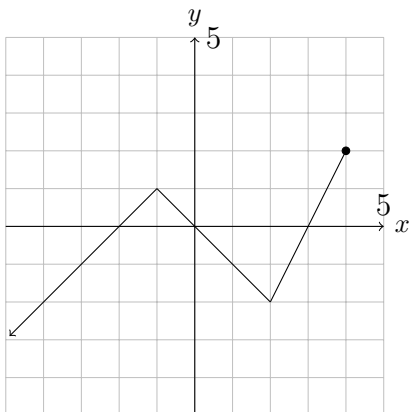
7.



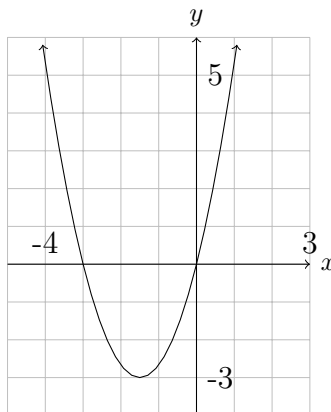
8.



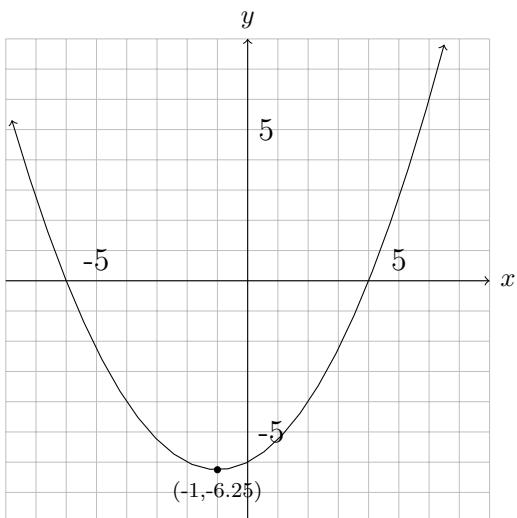
9.



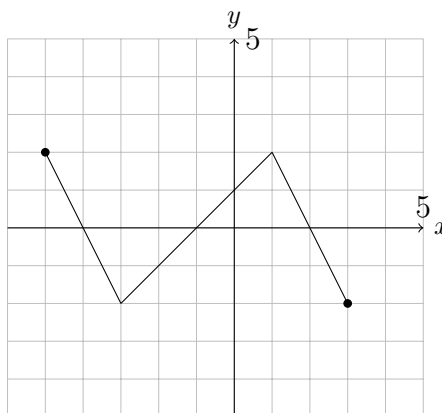
12.



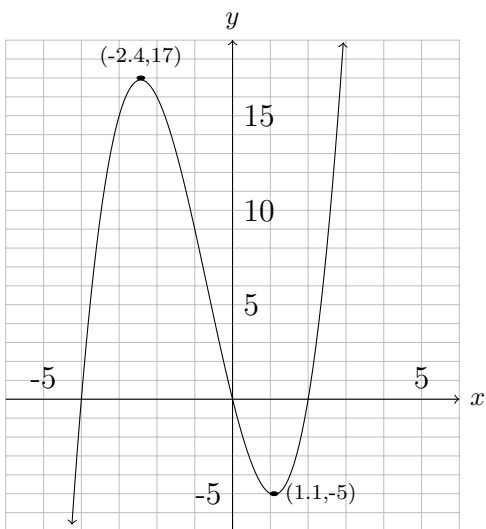
10.



13.



11.



Answers:

1.

- (a) 4
- (b) 14
- (c) $\frac{4}{5}$
- (d) 17

2.

- (a) -12
- (b) -7
- (c) $x = 0, x = \frac{2}{3}$

3.

- (a) 24
- (b) $x = -8, x = 2$
- (c) $\frac{47}{4}$

4. (a) $\frac{11}{4}$
 (b) $x = 0, x = -5$
 (c) $-\frac{19}{3}$
5. (a) 20
 (b) $\frac{55}{9}$
 (c) $a^2 + 2ah + h^2 + 6a + 6h + 4$
 (d) $x = -2, x = -4$
6. (a) \mathbb{R}
 (b) \mathbb{R}
 (c) $x = -1, x = 2, y = 1$
 (d) $+$: $(-\infty, -1) \cup (-1, 2), -$: $(2, \infty)$
 (e) Local Max: $(1, 2)$, Local Min: $(-1, 0)$
7. (a) \mathbb{R}
 (b) \mathbb{R}
 (c) $x = 2, y = 1$
 (d) $+$: $(-\infty, 2), -$: $(2, \infty)$
 (e) None.
8. (a) \mathbb{R}
 (b) $(-\infty, 4]$
 (c) $x = 0, x = 4, y = 0$
 (d) $+$: $(0, 4), -$: $(-\infty, 0) \cup (4, \infty)$
 (e) Local Max: $(2, 4)$
9. (a) $(-\infty, 4]$
 (b) $(-\infty, 2]$
 (c) $x = -2, x = 0, x = 3, y = 0$
- (d) $+$: $(-2, 0) \cup (3, 4], -$: $(-\infty, -2) \cup (0, 3)$
 (e) Local Max: $(-1, 1)$, Local Min: $(2, -2)$
10. (a) \mathbb{R}
 (b) $[-6.25, \infty)$
 (c) $x = -6, x = 4, y = -6$
 (d) $+$: $(-\infty, -6) \cup (4, \infty), -$: $(-6, 4)$
 (e) Local Min: $(-1, -6.25)$
11. (a) \mathbb{R}
 (b) \mathbb{R}
 (c) $x = -4, x = 0, x = 2, y = 0$
 (d) $+$: $(-4, 0) \cup (2, \infty), -$: $(-\infty, -4) \cup (0, 2)$
 (e) Local Max: $(-2.4, 17)$, Local Min: $(1.1, -5)$
12. (a) \mathbb{R}
 (b) $[-3, \infty)$
 (c) $x = -3, x = 0, y = 0$
 (d) $+$: $(-\infty, -3) \cup (0, \infty), -$: $(-3, 0)$
 (e) Local Min: $(-1.5, -3)$
13. (a) $[-5, 3]$
 (b) $[-2, 2]$
 (c) $x = -4, x = -1, x = 2, y = 1$
 (d) $+$: $[-5, 4) \cup (-1, 2), -$: $(-4, -1) \cup (2, 3]$
 (e) Local Max: $(1, 2)$, Local Min: $(-3, -2)$