

Solving Absolute value equations and Inequalities

1) The **sum** of all the solutions of $-\frac{3}{2}|x - 7| - \frac{5}{2} = -7$, is equal to

A) 14

B) 12

C) -14

D) 6

E) -6

2) The **sum** of all the solutions of the equation $|x - 2|^2 - |2 - x| = 6$ is

A) 4

B) 8

C) -1

D) -8

E) 1

3) If $(-\infty, m) \cup (n, \infty)$ is the solution set of the inequality

$$\left| \frac{5}{3} - \frac{1}{2}x \right| + \frac{1}{3} > \frac{4}{3}, \text{ then } n - m =$$

A) 4

B) 15

C) $\frac{20}{3}$

D) $\frac{11}{3}$

E) -4

4) If the solution set of $|x - a| < 1 - 2a$, is $-10 < x < 4$, then $a =$

A) -3

B) -5

C) -6

D) -4

E) -7

5) If $x \leq -\frac{1}{2}$, then the solution set of the inequality $|2x - 1| \geq |x^2 - 2x|$, is

A) $[-1, -\frac{1}{2}]$

B) \emptyset

C) $[-2, -1]$

D) $(-\infty, -1]$

E) $(-\infty, -\frac{1}{2}]$

6) The **solution set** of the inequality $8 + 3\left|x - \frac{1}{2}\right| \geq 2$ is

A) $(-\infty, \infty)$

B) $(-\infty, -\frac{3}{2}] \cup [\frac{5}{2}, \infty)$

C) $[-\frac{3}{2}, \frac{5}{2}]$

D) $(-\infty, 0) \cup (0, \infty)$

E) \emptyset

7) The solution set of $||x+1|-2|=5$ contains

- (a) two solutions
- (b) one solutions
- (c) three solutions
- (d) four solutions
- (e) five solutions

8) The sum of the solutions of the equation $\frac{|x-1|+2}{1+|x-1|} - \frac{3}{2} = 0$ is equal to

- (a) 2
- (b) 1
- (c) 0
- (d) -1
- (e) -5

9) The number of solutions of the equation $|2x-1|^3 - 5|2x-1|^2 + |8x-4| = 0$ is

- (a) 5
- (b) 3
- (c) 4
- (d) 0
- (e) 6

10) The solution set in interval notation of the inequality $\left|\frac{1}{2}-2x\right| \geq \frac{1}{2}$ is

- (a) $(-\infty, 0] \cup [1/2, \infty)$
- (b) $(-\infty, 0] \cup [1, \infty)$
- (c) $(-\infty, 1/4] \cup [1/2, \infty)$
- (d) $(-\infty, 0] \cup [1/4, \infty)$
- (e) $(-\infty, 1/2) \cup [1, \infty)$

11) The solution set of the compound inequality $-3|x|+6 < 12$ and $8-|2x-1| \geq 6$ is equal to

- (a) $[-1/2, 3/2]$
- (b) $(-\infty, \infty)$
- (c) $[-1/2, 0) \cup (0, 3/2]$
- (d) $(-\infty, 1/2] \cup [3/2, \infty)$
- (e) the empty set \emptyset

12) If the solution of $\left|x+\frac{6}{k+1}\right| \leq \frac{3}{k+1}$ is $[-3, -1]$, then $k =$

- (a) $\{2\}$
- (b) $\{2, -3\}$
- (c) $\{-1/2, 2\}$
- (d) $\{-2, -4\}$
- (e) \emptyset

13) The solution set of $||x+1|-2|=5$ contains

- (f) two solutions
- (g) one solutions
- (h) three solutions
- (i) four solutions
- (j) five solutions

14) The sum of the solutions of the equation $\frac{|x-1|+2}{1+|x-1|} - \frac{3}{2} = 0$ is equal to

- (a) 2
- (b) 1
- (c) 0
- (d) -1
- (e) -5

15) The solution set of the compound inequality $-3|x|+6 < 12$ and $8-|2x-1| \geq 6$

Answer: $\left[-\frac{1}{2}, \frac{3}{2}\right]$

16) The sum of all solutions of the equation $\frac{5}{2} - 4|3x-6| = -\frac{19}{3}$

Answer: 4

17) If $|3-2x| \leq 5$ is equivalent to $m \leq 5x+2 \leq n$, then

Answer: $m = -3$ and $n = 22$

18) The solution set of the equation

$$\frac{2|x+2|}{3} - \frac{1}{2} = \frac{4x+5}{6}$$

Answer: $[-2, \infty)$

19) The solution set, in interval notation, of the inequality

$$2 < |x-1| < 3 \text{ is equal to}$$

Answer: $(-2, -1) \cup (3, 4)$

20) If A is the solution set of $|3-2x| \leq 5$ and B is the solution set of $|x-2| > 1$, then $A \cap B =$

Answer: $[-1, 1) \cup (3, 4]$

21) The solution set in interval notation of the inequality $\left| \frac{1}{2} - 2x \right| \geq \frac{1}{2}$ is

Answer: $(-\infty, 0] \cup \left[\frac{1}{2}, \infty \right)$

22) Let A be the solution set of the inequality $4|x-3| > 12$, and B is the solution set of the inequality $|5-3x| \leq 7$, then $A \cap B =$

Answer: $\left(-\frac{2}{3}, 0 \right)$

23) The solution set, in interval notation, of the inequality $\left|\frac{2}{3}x - 1\right| - 2 > \frac{1}{3}$ is

Answer: $(-\infty, -2) \cup (5, \infty)$

24) The sum of the solutions of the equation $\left|\frac{6x+1}{x-1}\right| = 3$ is equal to

Answer: $-\frac{10}{9}$

25) The solution set of the equation $|-4, -3x| = |2 - 3x|$ contains:

Answer: only one solution

26) The solution set of the inequality $\left|\frac{1}{2}x + \frac{2}{3}\right| > 3$ in interval notation is:

Answer: $\left[-\infty, -\frac{22}{3}\right] \cup \left[\frac{14}{3}, \infty\right]$

27) The solution set of the equation $|5x, -1| = |2x + 3|$ contains:

Answer: one positive and one negative rational numbers

28) The solution set of the inequality $\left| \frac{2x+5}{x} \right| \leq 1$, in interval notation, is:

Answer: $\left[-5, -\frac{5}{3} \right]$

29) The **sum** of the solutions of $|(x+2)^2| = |(x+2)|$ is equal to

A) -6

30) The **sum** of all the solutions of $|x-6|^2 - 3|x-6| - 4 = 0$ is equal to

A) 12

B) 10

C) 25

D) 20

E) 15

31) The **number** of solutions of the equation $|x^2 - 2| = |x|$ is

A) 4

B) 1

C) 2

D) 5

E) 3

32) The sum of all the solutions of the equation $|x - 1| = |3x + 2|$ is

A) $-\frac{7}{4}$

B) 1

C) 0

D) $-\frac{1}{4}$

E) $-\frac{3}{2}$

33) The **sum** of all the solutions of the equation $|x - 1|^2 - 3|x - 1| - 4 = 0$ is

A) 2

B) 5

C) -2

D) -3

E) 8