

Meet 2

EVENT 6: Algebra II – Absolute Values & Inequalities

Exclude: Problems leading to inequalities/equations involving more than two distinct absolute value expressions.

Sample Problems:

A. Solve for all values x that satisfy $|x| \leq \frac{1}{x}$

Answer: $0 < x \leq 1$

B. Solve for x : $x^3 - x^2 - 2x < 0$

Answer: $x < -1$ or $0 < x < 2$

C. Solve for x : $|3 - 2x| - |6 + 3x| > |2 + x|$

Answer: $-\frac{11}{2} < x < -\frac{5}{6}$

Name _____ Score _____ School _____

Event 6: ALGEBRA II— Absolute Values and Inequalities

October 2017

A. Solve for x : $|4x^2 + 25| = |20x|$
(2 pts)

ANSWER: $x =$ _____

B. Solve for x : $|x - 2| \geq |5 - x|$
(3 pts)

ANSWER: _____

C. Solve for x : $1 < \frac{2}{3-x} \leq x$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II— Absolute Values and Inequalities

NOTE: In any answer containing an inequality, only the verbal connectives ("and"/"or") may be used.

October 2016

A. Solve for x : $x^2 - 9x > -18$
(2 pts)

ANSWER: _____

B. Solve for x : $|x^2 - 6x - 24| < 4x$
(3 pts)

ANSWER: _____

C. Solve for x : $\frac{14}{x-1} - 3(x-1) > 19$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

October 2015

A. Solve for x : $|-3x + 5| < 20$
(2 pts)

ANSWER: _____

B. Solve for x : $\frac{x+1}{x+2} < \frac{1}{x}$
(3 pts)

ANSWER: _____

C. Solve for x : $|x^2 + 3x + 2| > |2x + 4|$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

October 2014

A. Solve for x : $||x-4|-3|=2$
(2 pts)

ANSWER: $x =$ _____

B. Solve for x : $\frac{x-5}{x^2-x-6} \geq 0$
(3 pts)

ANSWER: _____

C. Solve for x : $\frac{|x-1|}{3} \leq \frac{1}{x+1}$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

NOTE: In any answer containing an inequality only the verbal connectives ("and"/"or") may be used.

October 2013

A. Solve for x : $x^2 + 5x + 6 < 0$
(2 pts)

ANSWER: _____

B. Solve for x : $\frac{x-8}{x} + x - 3 \leq 0$
(3 pts)

ANSWER: _____

C. Solve for x : $|x^2 + 6x + 16| < 8$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

October 2012

- A. If $|x + 1| \leq 3$ is equivalent to $a \leq \frac{1}{x + 5} \leq b$, find values for a and b .
(2 pts)

ANSWER: $a =$ _____ $b =$ _____

- B. The compound inequality $-11 < x < -7$ or $7 < x < 11$ can be written as $|x^2 - W| - M < 0$ where W and M are real numbers and $W > M$. Find the values of M and W .
(3 pts)

ANSWER: $M =$ _____ $W =$ _____

- C. Solve for x : $|x^2 - 4x + 2| > 1$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

2011

- A. The inequality $x \leq -4$ or $x \geq 10$ can be written as $|x - C| \geq D$ where C and D are integers.
(2 pts) Find the value of $C + D$.

ANSWER: _____

- B. Solve for x : $|2 - |x|| = 1$
(3 pts)

ANSWER: _____

- C. Solve for x : $|x^2 + 6x - 1| < 6$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

2010

NOTE: In any answer containing an inequality only the verbal connectives ("and"/"or") may be used.

A. Solve for x : $\frac{4x+1}{x+2} \leq \frac{6x+4}{x+2}$
(2 pts)

ANSWER: _____

B. Solve for x : $|x^2 - 2x - 16| - 8 \leq 0$
(3 pts)

ANSWER: _____

C. Solve for x : $|x^2 - 2x - 15| < |x+3| + |x-5| - 1$
(5 pts)

ANSWER: _____

A. Solve for x : $-2 < -2x + 3 \leq 7$
(2 pts)

ANSWER: _____

B. Solve for x : $\frac{3x^2 - 7x - 20}{x^2 - 16} \geq 0$
(3 pts)

ANSWER: _____

C. Solve for x : $|8 - 3x| < |5x - 3| \leq 6$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II — Absolute Values and Inequalities

2006

In any answer containing an inequality only the verbal connectives (“and” / “or”) may be used.

A. Solve for x : $3 - |2x + 3| \geq 2$
(2 pts)

ANSWER: _____

B. Solve for x : $|x^2 - 5| < 11$
(3 pts)

ANSWER: _____

C. Solve for x : $|x^2 - 3x - 1| > 3$
(5 pts)

ANSWER: _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II – Absolute Values and Inequalities

2007

A. (2 pts) Solve for x:

$$|-2x - 7| > 17$$

ANSWER _____

B. (3 pts) Solve for x:

$$\frac{x+1}{x-2} \leq -4x-7$$

ANSWER _____

C. (5 pts) Solve for x:

$$\left| \frac{5x+7}{x+2} \right| \geq 8$$

ANSWER _____

Name _____ Score _____ School _____

Event 6: ALGEBRA II – Absolute Values and Inequalities

2006

A. (2 pts) Solve for x:

$$1 - \left| \frac{1}{4}x + 8 \right| > \frac{3}{4}$$

ANSWER _____

B. (3 pts) Solve for x:

$$\frac{2x+5}{x+1} \geq 3$$

ANSWER _____

C. (5 pts) Solve for x:

$$|2x+1| + |3x-4| > 5$$

ANSWER _____

Event 6: Algebra II - Absolute Values and Inequalities (In any answer containing an inequality, only the verbal connectives "and"/"or" may be used)

A. (2 pts)

The inequality $1 < x < 6$ can be written as $|x + C| < D$ where C and D are rational numbers. Find the value of C .

ANSWER: _____

B. (3 pts)

Solve for x :

$$\frac{x-4}{x^2-2x-3} \geq 0$$

ANSWER: _____

C. (5 pts)

Solve for x :

$$|x-4| < 2x+8 < |6x-5|$$

ANSWER: _____

Name _____ S _____ School _____

Event 6: Algebra II - Absolute Values and Inequalities

2004

A. (2 pts)

Solve for x :

$$\frac{|x-3|}{-5} \geq -2$$

ANSWER: _____

B. (3 pts)

Solve for x :

$$\frac{2x-7}{x-5} \leq 3$$

ANSWER: _____

C. (5 pts)

Solve for x :

$$|2x-1| + |3x+2| < 4$$

ANSWER: _____

A. (2 pts)

Solve for x :

$$|2x - 3| \leq 4$$

ANSWER: _____

B. (3 pts)

Solve for x :

$$\frac{2}{x+1} \geq \frac{3}{x-3}$$

ANSWER: _____

C. (5 pts)

Solve for x :

$$|3 - 2x| < |x + 4| \leq 5$$

ANSWER: _____

Name _____ Score _____ School _____

Event 5: Algebra II - Absolute Values and Inequalities

2002

A. (2 pts)

Solve for x :

$$3(x - 4) > 15 \quad \text{or} \quad 2(x - 6) \leq 8$$

ANSWER: _____

B. (3 pts)

Solve for x :

$$\frac{2x^2 - 9x - 5}{x^2 - 2x - 15} \leq 0$$

ANSWER: _____

C. (5 pts)

Solve for x :

$$|x + 1| + |x - 1| \leq 2$$

ANSWER: _____

Name _____ Score _____ School _____

Event 5: Algebra II - Absolute Values and Inequalities

2001

A. (2 pts)

Solve for x :

$$\left|2 - \frac{3}{5}x\right| < 5$$

ANSWER: _____

B. (3 pts)

Solve for x :

$$\frac{3x+1}{x-2} < 1$$

ANSWER: _____

C. (5 pts)

Solve for x :

$$|3x - 2| - |2x + 4| > |x + 2|$$

ANSWER: _____

Name _____ Score _____ School _____

Event 5: ALGEBRA II - Absolute Values and Inequalities

2000

NOTE: In any answer containing more than one inequality, only the verbal connectives ("and," "or") may be used.

A. (2 pts) Solve for x:

$$\left| \frac{2x-3}{5} \right| > 4$$

ANSWER _____

B. (3 pts) Solve for x:

$$|2x| - |x+1| = 1$$

ANSWER _____

C. (5 pts) Solve for x:

$$\left| \frac{x}{x+2} \right| < 1$$

ANSWER _____

A. (2 pts)

A game show contestant must guess the price of a new car. To be a winner, the contestant's guess must be no more than \$150 away from the actual price. If the actual price of the car is \$15,997, the winning guess would have to be between what two amounts?

ANSWER: Between \$ _____ and \$ _____

B. (3 pts)

Solve for y .

$$|y - 4| > y - 4$$

ANSWER: _____

C. (5 pts)

Solve for x .

$$|2x - 1| - x < 2$$

ANSWER: _____

Name _____ Score _____ School _____

Event 5: Algebra II - Absolute Values and Inequalities

Note: Utilize the word "AND" or "OR" to state your answer when necessary.

1998

A. (2 pts)

Solve for x :

$$||x| + 4| = 6$$

ANSWER: _____

B. (3 pts)

Solve for x :

$$|x^2 + 3x - 1| < 3$$

ANSWER: _____

C. (5 pts)

Solve for x :

$$|(x-1)^4| + 2|(x-1)^3| - 3|(x-1)^2| > 0$$

ANSWER: _____

Name _____ Score _____ School _____

Event 5: ALGEBRA II - Absolute Values and Inequalities

1997

*Note: In any answer containing an inequality, only the verbal connectives ("and" or "or") may be used.

A. (2 pts) Solve for x:

$$\frac{|3x + 2|}{2} \leq \frac{1}{6}$$

ANSWER _____

B. (3 pts) Solve for x:

$$\frac{2x - 4}{-8} \leq 2x + 5 \leq \frac{4x + 5}{-3}$$

ANSWER _____

C. (5 pts) Solve for x:

$$|x| + |x - 2| > 5$$

ANSWER _____

Name _____ Score _____ School _____

Event 5: ALGEBRA II - Absolute values and inequalities

1996

In any answer containing an inequality only the verbal connectives ("and"/"or") may be used.

A. (2 pts) Solve for x : $\left| \frac{1}{3}(5-2x) \right| \leq 1$

Answer _____

B. (3 pts) Solve for x : $|2-3x|+2x \leq 4$

Answer _____

C. (5 pts) Solve for x : $|x-1|+2|x-3| \geq 4$

Answer _____

Name _____ Score _____ School _____

Event 5: ALGEBRA II - Absolute values and inequalities

1995

NOTE: In any answer containing an inequality only the verbal connectives ("and"/ "or") may be used.

A. (2 pts) Solve for x: $|3x + 5| = 1$

ANSWER _____

B. (3 pts) Solve for x: $\frac{x}{x+3} > 4$

ANSWER _____

C. (5 pts) Solve for x: $\left| \frac{3x-2}{x-4} \right| \geq 5$

ANSWER _____

Name _____ Score _____ School _____

Event 5: ALGEBRA II - Absolute Values and Inequalities

1994

A. (2 pts) Solve for x:

$$\left| \frac{x + 2}{3x - 1} \right| = 5$$

ANSWER _____

B. (3 pts) Solve for x:

$$\frac{1 + x}{1 - x} \geq 1$$

ANSWER _____

C. (5 pts) Solve for x:

$$\frac{|2x + 7|}{3x} > 4$$

ANSWER _____

Name _____ Score _____ School _____

Event 5: ALGEBRA II - Absolute Values and Inequalities

1993

A. (2 pts) Solve for x:

$$|4x - 8| - 9 < 7$$

ANSWER _____

B. (3 pts) Solve for y:

$$|4y^2 + 15| = |y^4 + 3|$$

ANSWER _____

C. (5 pts) Solve for x:

$$|x^2 - 3x + 2| - |x - 1| - |x - 2| > -1$$

ANSWER _____

Meet 2, Event 6: ALGEBRA II
Absolute Values & Inequalities

2017

- A. $-5/2, 5/2$
- B. $x \geq 7/2$
- C. $1 < x \leq 2$

2016

- A. $x < 3$ or $x > 6$
- B. $6 < x < 12$
- C. $x < -6$ or $1 < x < 5/3$

2015

- A. $-5 < x < 25/3$
- B. $-2 < x < -\sqrt{2}$ or $0 < x < \sqrt{2}$
- C. $x < -3$ or $x > 1$

2014

- A. $-1, 3, 5, 9$
- B. $-2 < x < 3$ or $x \geq 5$
- C. $-1 < x \leq 2$

2013

- A. $-3 < x < -2$
- B. $x \leq -2$ or $0 < x \leq 4$
- C. $-4 < x < -2$

2012

- A. $a = 1/7, b = 1$
- B. $M = 36, W = 85$
- C. $x < 2 - \sqrt{3}, 1 < x < 3, x > 2 + \sqrt{3}$

2011

- A. 10
- B. $\pm 1, \pm 3$
- C. $-7 < x < -5$ or $-1 < x < 1$

2010

- A. $x < -2$ or $x \geq -3/2$
- B. $-4 \leq x \leq -2$ or $4 \leq x \leq 6$
- C. $-4 < x < -2$ or $4 < x < 6$

2009

- A. $-2 \leq x < 5/2$
- B. $x < -4$ or $-5/3 \leq x < 4$ or $x > 4$
- C. $11/8 < x \leq 9/5$

2008

- A. $-2 \leq x \leq -1$
- B. $-4 < x < 4$
- C. $x < -1$ or $1 < x < 2$ or $x > 4$

2007

- A. $x < -12$ or $x > 5$
- B. $x \leq -\sqrt{13}/2$ or $\sqrt{13}/2 \leq x < 2$
- C. $-3 \leq x < -2$ or $-2 < x \leq -23/13$
(OR) $-3 \leq x \leq -23/13$ and $x \neq -2$

2006

- A. $-33 < x < -31$
- B. $-1 < x \leq 2$
- C. $x < 0$ or $x > 8/5$

2005

- A. $-7/2$
- B. $-1 < x < 3$ or $x \geq 4$
- C. $-4/3 < x < -3/8$ or $x > 13/4$

2004

- A. $-7 \leq x \leq 13$
- B. $x < 5$ or $x \geq 8$
- C. $-1 < x < 3/5$

2003

- A. $-1/2 \leq x \leq 7/2$
- B. $x \leq -9$ or $-1 < x < 3$
- C. $-1/3 < x \leq 1$

2002

- A. \mathbb{R} , all Reals, Reals, $(-\infty, \infty)$, $\{x : x \in \mathbb{R}\}$
- B. $-3 < x \leq -1/2$
- C. $-1 \leq x \leq 1$

2001

- A. $-5 < x < 35/3$
- B. $-3/2 < x < 2$
- C. $x < -2/3$

2000

- A. $x < -17/2$ or $x > 23/2$
- B. $-2/3, 2$
- C. $x > -1$

1999

- A. Between \$15,847 and \$16,147
- B. $y < 4$
- C. $-1/3 < x < 3$

Note: Answers are shown as they appear on the original answer keys. There may be inconsistencies with the formatting of these answers. In all cases, consult the Guidelines for Forms of Answers to determine the correct formatting.

1998

- A. ± 2
- B. $-4 < x < -2$ or $-1 < x < 1$
- C. $x < 0$ or $x > 2$

1997

- A. $-7/9 \leq x \leq -5/9$
- B. -2
- C. $x < -3/2$ or $x > 7/2$

1996

- A. $1 \leq x \leq 4$
- B. $-2 \leq x \leq 6/5$
- C. $x \leq 1$ or $x \geq 11/3$

1995

- A. $-4/3, -2$
- B. $-4 < x < -3$
- C. $11/4 \leq x \leq 9$ and $x \neq 4$
(OR) $11/4 \leq x < 4$ or $4 < x \leq 9$

1994

- A. $3/16, 1/2$
- B. $0 \leq x < 1$
- C. $0 < x < 7/10$

1993

- A. $-2 < x < 6$
- B. $\pm\sqrt{6}$
- C. $x < 0$ or $1 < x < 2$ or $x > 3$