Linear Equations in One Variable

CollegeBoard Question Bank

Abstract

This exercise sheet contains

- an **Easy** category with 14 questions;
- a **Medium** category with 11 questions;
- a **Hard** category with 9 questions

for you to attempt. A digital copy of this sheet is available for you on moodle. Feel free to utilize the **Question Space** on Teams to ask for guidance.

Best,
Omar :)

Linear Equations in One Variable

Easy

(1) **6ac23de7** MULTIPLE CHOICE One answer only

In the equation above, what is the value of x?

$$\frac{4x}{5} = 20$$

a. 16
b. 24
c. 15
d. 25

(2) **7392dfc1** MULTIPLE CHOICE One answer only

Which of the following is equivalent to $4x + 6 = 12$?

a. $3x + 2 = 4$
b. $2x + 4 = 6$
c. $2x + 3 = 6$
d. $x + 3 = 3$

(3) **93954cfa** MULTIPLE CHOICE One answer only

One pound of grapes costs \$2. At this rate, how many dollars will c pounds of grapes cost?

a. $\frac{2}{c}$
b. $2c$
c. $2 + c$
d. $\frac{c}{2}$

(4) **3d04de9c** MULTIPLE CHOICE One answer only

A principal used a total of 25 flags that were either blue or yellow for field day. The principal used 20 blue flags. How many yellow flags were used?

a. 25
b. 30
c. 5
d. 20

(5) **60f71697** MULTIPLE CHOICE One answer only

$8x = 88$. What value of x is the solution to the given equation?

a. 96
b. 11
c. 80
d. 704

(6) **550b352c** MULTIPLE CHOICE One answer only

$$10 = 2x + 4$$

How many solutions exist to the equation shown above?

a. Infinitely many
b. Exactly 3
c. None
d. Exactly 1

(7) **ed18c4f7** MULTIPLE CHOICE One answer only

Cathy has n CDs. Gerry has 3 more than twice the number of CDs that Cathy has. In terms of n, how many CDs does Gerry have?

a. $2n + 3$
b. $2n - 3$
c. $3n + 2$
d. $3n - 2$

(8) **d9d83c02** MULTIPLE CHOICE One answer only

For what value of w does $w - 10 = 2(w + 5)$

a. 0
b. -15
c. 5
d. -20

(9) **7a987ae4** MULTIPLE CHOICE One answer only

If $\frac{2n}{5} = 10$, what is the value of $2n - 1$?

a. 99
b. 50
c. 24
d. 49

(10) **9ff10b3b** MULTIPLE CHOICE One answer only

If $\frac{1}{2}x - \frac{1}{6}x = 1$, what is the value of x?

a. -4
b. 6
c. 3
d. $\frac{1}{3}$

(11) **4f7981a0** SHORT ANSWER Case-Insensitive

If $3x + 2 = 8$ what is the value of $9x + 6$?

(12) **46f68129** MULTIPLE CHOICE One answer only

A librarian has 43 books to distribute to a group of children. If he gives each child 2 books, he will have 7 books left over. How many children are in the group?

a. 15
b. 25
c. 18
d. 29

(13) **e53870b6** SHORT ANSWER Case-Insensitive

$$6x + k = 6x + 5$$

In the given equation, k is a constant. If the equation has infinitely many solutions, what is the value of k?

(14) **a9c04a21** MULTIPLE CHOICE One answer only

What is the solution to the equation

$$2x + 3 = 7?$$

a. 1.5
b. 1
c. 2
d. 4

Medium

(1) **7a5a74a6** MULTIPLE CHOICE One answer only

$$3(2x - 6) - 11 = 4(x - 3) + 6$$

If x is the solution to the equation above, what is the value of $x - 3$?

a. $-\frac{15}{2}$
b. $\frac{23}{2}$
c. $\frac{17}{2}$
d. $\frac{15}{2}$

(2) **aa85b138** MULTIPLE CHOICE One answer only

A tree had a height of 6 feet when it was planted. The equation above can be used to find how many years n it took the tree to reach a height of 14 feet. Which of the following is the best interpretation of the number 2 in this context?

a. The average number of feet that the tree grew per year
b. The height, in feet, of the tree when the tree was 1 year old
c. The average number of years it takes similar trees to grow 14 feet
d. The number of years it took the tree to double its height

(3) **15daa8d6** SHORT ANSWER Case-Insensitive

$$2x + 16 = a(x + 8)$$

In the given equation, a is a constant. If the equation has infinitely many solutions, what is the value of a?

(4) **12ee1edc** MULTIPLE CHOICE One answer only

$$(b-2)x = 8$$

In the given equation, b is a constant. If the equation has no solution, what is the value of b?

a. 2
b. 10
c. 4
d. 6

(5) **70e29454** MULTIPLE CHOICE One answer only

$$a(3 - x) - b = -1 - 2x$$

In the equation above, a and b are constants. If the equation has infinitely many solutions, what are the values of a and b?

a. $a = 2,\ b = 7$
b. $a = 2,\ b = 1$
c. $a = -2,\ b = -5$
d. $a = -2,\ b = 5$

(6) **f09097b1** SHORT ANSWER Case-Insensitive

An agricultural scientist studying the growth of corn plants recorded the height of a corn plant at the beginning of a study and the height of the plant each day for the next 12 days. The scientist found that the height of the plant increased by an average of 1.20 centimeters per day for the 12 days. If the height of the plant on the last day of the study was 36.8 centimeters, what was the height, in centimeters, of the corn plant at the beginning of the study?

(7) **4f669597** SHORT ANSWER Case-Insensitive

$$2(p+1)+8(p-1)=5p$$

What value of p is the solution of the equation above?

(8) **ce314070** MULTIPLE CHOICE One answer only

If $4x - \frac{1}{2} = -5$, what is the value of $8x - 1$?

a. -10
b. $-\frac{9}{8}$
c. $-\frac{5}{2}$
d. 2

(9) **36ab4122** MULTIPLE CHOICE One answer only

Megan's regular wage at her job is p dollars per hour for the first 8 hours of work in a day plus 1.5 times her regular hourly wage for work in excess of 8 hours that day. On a given day, Megan worked for 10 hours, and her total earnings for that day were $137.50. What is Megan's regular hourly wage?

a. $13.75
b. $11.75
c. $13.25
d. $12.50

(10) **5ad9eff0** MULTIPLE CHOICE One answer only

The width of a rectangular dance floor is w feet. The length of the floor is 6 feet longer than its width. Which of the following expresses the perimeter, in feet, of the dance floor in terms of w?

a. $4w + 12$
b. $w^2 + 6$
c. $2w + 6$
d. $w^2 + 6w$

(11) **45bba652** MULTIPLE CHOICE One answer only

If $2(x-5)+3(x-5)=10$, what is the value of $x-5$?

a. 5
b. 7
c. 12
d. 2

Hard

(1) **2937ef4f** MULTIPLE CHOICE One answer only

Hector used a tool called an auger to remove corn from a storage bin at a constant rate. The bin contained $24,000$ bushels of corn when Hector began to use the auger. After 5 hours of using the auger, $19,350$ bushels of corn remained in the bin. If the auger continues to remove corn at this rate, what is the total number of hours Hector will have been using the auger when $12,840$ bushels of corn remain in the bin?

a. 3
b. 8
c. 7
d. 12

(2) **b7e6394d** MULTIPLE CHOICE One answer only

Alan drives an average of 100 miles each week. His car can travel an average of 25 miles per gallon of gasoline. Alan would like to reduce his weekly expenditure on gasoline by \$5. Assuming gasoline costs \$4 per gallon, which equation can Alan use to determine how many fewer average miles, m, he should drive each week?

a. $\frac{4}{25}m = 95$
b. $\frac{25}{4}m = 5$
c. $\frac{25}{4}m = 95$
d. $\frac{4}{25}m = 5$

(3) **e6cb2402** SHORT ANSWER Case-Insensitive

$$3(kx + 13) = \frac{48}{17}x + 36$$

In the given equation, k is a constant. The equation has no solution. What is the value of k?

(4) **ae2287e2** MULTIPLE CHOICE One answer only

A certain product costs a company \$65 to make. The product is sold by a salesperson who earns a commission that is equal to 20% of the sales price of the product. The profit the company makes for each unit is equal to the sales price minus the combined cost of making the product and the commission. If the sales price of the product is \$100, which of the following equations gives the number of units, u, of the product the company sold to make a profit of \$6,840 ?

a. $(0.2(100) + 65)u = 6,840$
b. $0.8(100) - 65u = 6,840$
c. $(100 - 65)(1 - 0.8)u = 6,840$
d. $(100(1 - 0.2) - 65)u = 6,840$

(5) **771bd0ca** SHORT ANSWER Case-Insensitive

$$5(t+3)-7(t+3)=38.$$

What value of t is the solution to the given equation?

(6) **90095507** MULTIPLE CHOICE One answer only

The Townsend Realty Group invested in the five different properties

Property Address	**Purchase Price (Dollars)**	Monthly Rental Price (Dollars)
Clearwater Lane	128,000	950
Driftwood Drive	176,000	1,310
Edgemont Street	70,000	515
Glenview Street	140,000	1,040
Hamilton Circle	450,000	3,365

listed in the table above. The table shows the amount, in dollars, the company paid for each property and the corresponding monthly rental price, in dollars, the company charges for the property at each of the five locations. Townsend Realty purchased the Glenview Street property and received a 40% discount off the original price along with an additional 20% off the discounted price for purchasing the property in cash. Which of the following best approximates the original price, in dollars, of the Glenview Street property?

a. $350,000
b. $291,700
c. $233,300
d. $175,000

(7) **aee9fd2d** MULTIPLE CHOICE One answer only

If $\frac{x+6}{3} = \frac{x+6}{13}$, the value of $x + 6$ is between which of the following pairs of values?

a. -2 and 2
b. 2 and 7
c. 8 and 13
d. -7 and -3

(8) **3f8a701b** MULTIPLE CHOICE One answer only

The equation

$$9x + 5 = a(x + b),$$

where a and b are constants, has no solutions. Which of the following must be true?

1. $a = 9$
2. $b = 5$
3. $b \neq \frac{5}{9}$

a. None
b. 1 and 3 only
c. 1 only
d. 1 and 2 only

(9) **628300a9** MULTIPLE CHOICE One answer only

A science teacher is preparing the 5 stations of a science laboratory. Each station will have either Experiment A materials or Experiment B materials, but not both. Experiment A requires 6 teaspoons of salt, and Experiment B requires 4 teaspoons of salt. If x is the number of stations that will be set up for Experiment A and the remaining stations will be set up for Experiment B, which of the following expressions represents the total number of teaspoons of salt required?

a. $5x$
b. $10x$
c. $10x + 20$
d. $2x + 20$

Total of marks: 34