14th October

Completed Exercises from the lecture on

〈Linear Equations in one variable〉

1. Easy, Page 2-13;

2. Medium, Page 14-16;

Can be found below.

ID: 6ac23de7

$\frac{4x}{5} = 20$ In the equation above, what is the value of x ?

A. 25

B. 24

C. 16

D. 15

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

$= \underbrace{\frac{4}{5} \cdot \frac{5}{4}}_{=1} x = 20 \cdot \frac{5}{4}$

$\Rightarrow x = 20 \cdot \frac{5}{4} = 25.$

ID: 7392dfc1

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

A. $2x+4=6$

B. $x+3=3$

C. $3x+2=4$

D. $2x+3=6$

$$4x+6=12$$

$$\frac{2}{2}(2x+3)=\frac{12}{2} \Rightarrow 2x+3=6$$

ID: 93954cfa

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

A. $2c$

B. $2+c$

C. $\frac{2}{c}$

D. $\frac{c}{2}$

$2 + 2 + 2 + \cdots + 2 = 2 \cdot c$

ID: 3d04de9c

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. 5

B. 20

C. 25

D. 30

$25 = \square + \square$

$25 = 20 + \square \quad (-20)$

$5 = 25 - 20 \quad = \square$

ID: 60f71697

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

A. 11

B. 80

C. 96

D. 704

ID: 550b352c

$10 = 2x + 4$

How many solutions exist to the equation shown above?

A. None

B. Exactly 1

C. Exactly 3

D. Infinitely many

$10 = 2x + 4 \quad -4$

$10 - 4 = 2x \quad \times \frac{1}{2}$

$\frac{10-4}{2} = x$

ID: ed18c4f7

(+1) 2x = n

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. $3n-2$

B. $3n+2$

C. $2n-3$

D. $2n+3$

Cathy: n

Gerry: $3+2\cdot n$

ID: 9ff10b3b

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

A. -4

B. $\frac{1}{3}$

C. 3

D. 6

$a\cdot(b+c)=a\cdot b+a\cdot c$

$\frac{1}{2}x-\frac{1}{6}x=1$

$x\left(\frac{1}{2}-\frac{1}{6}\right)=1$

$x\left(\frac{3}{6}-\frac{1}{6}\right)=1 \Rightarrow x\cdot\frac{1}{3}=1 \quad \cdot 3$

$\Rightarrow x=3$

ID: 4f7981a0

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

$3x+2=8 \qquad (\times 3)$

$9x+6=24$

ID: 46f68129

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. 18

C. 25

D. 29

$B = 43$

$2 \cdot C$

$43 - 2 \cdot C = 7 \quad -43$

$-2 \cdot C = 7 - 43 \quad \cdot \frac{1}{-2}$

$C = \frac{7-43}{-2} = 18$

ID: e53870b6

$6x + k = 6x + 5$

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

$6x + K = 6x + 5$ $\quad -6x$

$\boxed{K = 5}$

$6x + 5 = 6x + 5$ is true

for any x!

$x = x$

ID: 7a5a74a6

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

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

A. $\frac{23}{2}$

B. $\frac{17}{2}$

C. $\frac{15}{2}$

D. $-\frac{15}{2}$

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

$6x-18-11=4x-12+6$

$-29 \qquad -6$

$6x-29=4x-6 \qquad (+29)\ (-4x)$

$2x=6x-4x=-6+29=23$

$x-3=\frac{23}{2}-\frac{6}{2}=\frac{17}{2}$

Another way:

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

$3\cdot[2\cdot(x-3)]-11=4(x-3)+6$

$6\cdot(x-3)-11=4(x-3)+6 \qquad (+11)$

$6\cdot(x-3)=4(x-3)+17 \qquad [-4(x-3)]$

$6(x-3)-4(x-3)=17$

$2(x-3)=17 \qquad \times\frac{1}{2} \Rightarrow \boxed{(x-3)=\frac{17}{2}}$

ID: aa85b138

$2n + 6 = 14$

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 number of years it took the tree to double its height

B. The average number of feet that the tree grew per year

C. The height, in feet, of the tree when the tree was 1 year old

D. The average number of years it takes similar trees to grow 14 feet

$2n + 6 = 14$

$n = 4$

$2 \cdot 4 + 6 = 14$

6 —(4 years)→ 14

8 ft in 4 yrs

2 ft in 1 yr

ID: 15daa8d6

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

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

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

$2 \cdot (x+8) = a(x+8)$

Choosing $a = 2$ gives a statement true for any x!