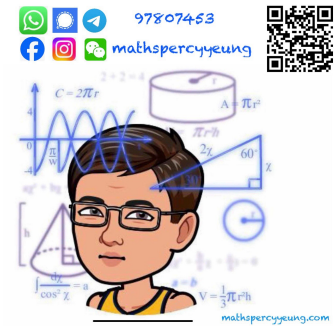# Ch 12. Linear Equations in One Unknown **Set 1 Q**

Solve the following equations and check the solutions.

(a) $x - 7 = -15$

(b) $x + 9 = 14\frac{1}{2}$

If x is an unknown, solve the literal equation $\dfrac{(k+5)x}{3} - \dfrac{(m-2)x}{4} = 5$.

Solve the following equations and check the solutions.

(a) $-4a = 28$

(b) $\dfrac{b}{6} = -5$

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Solve the following equations and check the solutions.

(a) $5a + 7 = 22$

(b) $\dfrac{7 - 2y}{5} = 1$

Solve the following equations.

(a) $7y - 4y = 30$

(b) $5a + 18 - 3a = -10$

Solve the equation $6n + 8 = 56 - 2n$.

Solve the following equations.
(a) $3p - 2 = 5(8 + p)$
(b) $7(7 - q) = 4(q + 4)$

Solve the equation $6(y - 4) = 5[17 - 3(2y - 13)]$.

Solve the following equations.
(a) $\dfrac{x}{3} - \dfrac{2x}{5} = \dfrac{4}{15}$
(b) $\dfrac{3y - 4}{4} + \dfrac{5}{6} = \dfrac{y + 7}{3}$

Solve the equation $\dfrac{5(3x+1)}{2} - 11 = 2\left(x + \dfrac{1}{3}\right)$.

Mary has $\$x$. She spends $\$80$ to buy a dress, and has $\$50$ left. Find the value of x.

There are some red balls and green balls. If the number of red balls is greater than the number of green balls by 22, and the total number of balls is 50, find the number of red balls.

Tom buys a monitor and a scanner for $\$2100$. If the price of the monitor is $\$300$ more than twice that of the scanner, find the price of the scanner.

There are some 50 g weights and 100 g weights, and their total weight is 1550 g. If the number of 100 g weights is 2 less than three times that of 50 g weights, find the number of 50 g weights.

If x is an unknown, solve the literal equation $\dfrac{7c + ax}{e} = d$.

Solve the literal equation for y: $\dfrac{1}{2}\left(\dfrac{y}{a} - \dfrac{b}{3}\right) = y$.

Solve the following equations and check the solutions.

(a) $\quad 5\left(2 + \dfrac{3x}{4}\right) = 55$

(b) $\quad 4\left(\dfrac{14 - 3y}{15}\right) = 1\dfrac{1}{3}$

Solve the equation $2y - (10 - 3y) = 25$.

Solve the equation $3 + 2r = \dfrac{5 - 6(r + 2)}{3}$.

Solve the equation $\dfrac{12 - [4 - 2(y + 1)]}{2} = 2y + 6$.

Solve the equation $\dfrac{t+1}{6} + \dfrac{3(t-1)}{8} = \dfrac{5(t+1)}{12}$.

A father is 27 years older than his son. Five years later, the sum of their ages will be 49. Find their present ages.

Jack bought a cake and ate $\frac{3}{10}$ of it. May ate $\frac{5}{14}$ of the remaining and 450 g of the cake was left. Find the original weight of the cake.

David has 34 stamps and there are three types of stamps: $1.4 stamps, $2.5 stamps and $3.1 stamps. The number of $1.4 stamps is 2 more than three times that of $3.1 stamps. The number of $2.5 stamps is more than the number of $3.1 stamps by 7. Find the total value of the stamps.

By the method of substitution, check whether $a = -16$ is the solution of the equation $\dfrac{3a}{4} + 1 = -11$.

Simplify $\dfrac{x}{4} + \dfrac{x}{3}$.

Simplify $\dfrac{x}{2} - 3\left(\dfrac{x}{9} - 4\right) + \dfrac{2x}{3}$.

It is given that a bus and a minibus can carry x passengers and y passengers respectively.
(a)   Write down the formula for calculating the total number (P) of passengers 3 bus and 5 minibus can carry.
(b)   If $x = 60$ and $y = 16$, find the value of P.

Emily pays $42 for 3 magazines and a piece of newspaper. If the price of each piece of newspaper is $6 and the prices of the 3 magazines are the same, set up an algebraic equation to find the price of a magazine.

By the method of substitution, check whether $b = 3$ is the solution of the equation $-3b + 15 = 6b$.

By the method of substitution, check whether $p = -4$ is the solution of the equation $-2(3p + 2p) = 20$.

By guessing and checking, find the solution of $5 - x = 1$.

By guessing and checking, find the solution of $\frac{y}{3} = 6$.

By guessing and checking, find the solution of $2x + 1 = 15$.

Simplify $6x + 2x - x$.

Simplify $x + 2y - 5x - 7y$.

Simplify $3(x - 2y)$.

Simplify $-5(x - 4)$.

Simplify $x + \dfrac{1}{2}(4x - 6)$.

Solve the equation $x + 4 = 7$ and check the solution.

Solve the equation $x - 6 = -14$ and check the solution.

Solve the equation $5y = 15$ and check the solution.

Solve the equation $\dfrac{2y}{5} = -16$ and check the solution.

Solve the equation $-3y + 60 = 48$ and check the solution.

Solve the equation $4x - 7 = 33$ and check the solution.

Solve the equation $\dfrac{y}{3} + 4 = 10$ and check the solution.

Solve the equation $\dfrac{s + 9}{5} = -18$ and check the solution.

Solve the equation $\dfrac{50 - t}{7} = 6$ and check the solution.

Solve the equation $6 - (1 + x) = 2$ and check the solution.

Solve the equation $7(5 - z) = 14$ and check the solution.

Solve the equation $\dfrac{2y}{5} + \dfrac{3}{5} = 3$ and check the solution.

Solve the equation $\dfrac{m}{3} - \dfrac{1}{6} = 2$ and check the solution.

Solve the equation $4x + 2x = 36$.

Solve the equation $5y - 2y + 5 = 11$.

Solve the equation $4 - 5z = 3z$.

Solve the equation $15m + 2 = 22 - 5m$.

Solve the equation $3x + 24 = 11x - 8$.

Solve the equation $1.5k + 8.8 = -0.7k$.

Solve the equation $2n + 2 = 1 - (4 - n)$.

Solve the equation $x + 2(x + 1) = 4(x - 1)$.

Solve the equation $\dfrac{4y}{3} - \dfrac{7y}{3} = 5$.

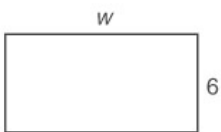Solve the equation $\dfrac{3t}{4} - \dfrac{t}{2} = 1$.

Solve the equation $\dfrac{5y}{7} + 1 = \dfrac{3y}{5}$.

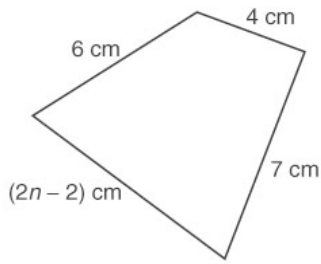Solve the equation $\dfrac{3}{5} - \dfrac{9p}{10} = \dfrac{3p}{10}$.

The sum of x times 5 and 2 is -4. Find the value of x.

The product of 6 and a is greater than the sum of 6 and a by 39. Find the value of a.

In the figure, the perimeter of the rectangle is 54. Find the value of w.

In the figure, the perimeter of the quadrilateral is 25 cm. Find the value of n.

Tom has x. Jack has $50 more than twice the amount Tom has. If their sum is $170, how much does Jack have?

Amy travels by a car of speed y km/h for 2 hours, then she walks for 5 km. If she travels 133 km in total, find the value of y.

Mabel weighs 71 kg and Carol weighs z kg. If Mabel's weight is 40 kg less than 3 times Carol's weight, find the value of z.

If each side of an equilateral triangle is decreased by 2 cm, the perimeter of the new triangle is $\dfrac{4}{5}$ that of the original one. Find the length of a side of the original triangle.

A plant of 12.5 cm tall grows with a speed of 3.25 cm per week. How long does it take to be 51.5 cm tall?

$140 is shared among A, B and C. If A gets $10 more than B and B gets $20 more than C, find the amount each of them get.

Solve the literal equation $x + ab = c$ for x.

Solve the literal equation $\dfrac{3n}{b} = c$ for n.

Solve the literal equation $5y - a = 7b$ for y.

Solve the literal equation $4z - vw = t$ for z.

Solve the literal equation $\dfrac{m}{5} - nx = q$ for x.

Solve the equation $4 - 7y = -10$ and check the solution.

Solve the equation $0.5m + 3.6 = -3.4$ and check the solution.

Solve the equation $-2 + \dfrac{3x}{7} = -11$ and check the solution.

Solve the equation $10 - \dfrac{4d}{3} = 16$ and check the solution.

Solve the equation $\dfrac{4}{9} - \dfrac{y}{3} = \dfrac{1}{2}$ and check the solution.

Solve the equation $\dfrac{1 + 2x}{5} = -5$ and check the solution.

Solve the equation $\dfrac{3z - 4}{2} - 3 = 1$ and check the solution.

Solve the equation $6 = 9 + \dfrac{1 - 5x}{8}$ and check the solution.

Solve the equation $1 - \left(5 - \dfrac{8x}{9}\right) = 8$ and check the solution.

Solve the equation $\dfrac{2t-3}{6} + \dfrac{1}{3} = -\dfrac{1}{2}$ and check the solution.

Solve the equation $5x + 8.8 = -2(0.4 - x) - (x - 1.2)$.

Solve the equation $4[3(y - 1) + 5y] = 84$.

Solve the equation $2q - 1 = 3[7q - (q - 5)]$.

Solve the equation $\dfrac{m + 6}{5} = \dfrac{9}{5} - 2(m - 3)$.

Solve the equation $\dfrac{11-5t}{12} = \dfrac{3t-4}{5}$.

Solve the equation $\dfrac{2-s}{2} = s + \dfrac{6-s}{7}$.

Solve the equation $\dfrac{x-4}{5} - (x-3) = 1$.

Solve the equation $\dfrac{y}{2} + \dfrac{2(y-8)}{3} = \dfrac{3y+2}{4}$.

Solve the equation $\dfrac{1}{5}\left[\dfrac{1}{2}(4x+1)+\dfrac{1}{4}\right]=\dfrac{x}{10}$.

Solve the equation $\dfrac{1.8-8y}{12}=\dfrac{3(y-0.4)}{6}-\dfrac{5y-0.3}{4}$.

If the sum of three consecutive odd numbers is 123, find the values of these three numbers.

Daisy pays $68 for 5 notebooks and 2 pens. If the price of each notebook is 3 times that of a pen, find the price of
(a) a pen,
(b) 2 notebooks and 3 pens.

May is now x years old. Her mother's age is 3 times May's age.
(a) Express in terms of x,
    (i) May's age,
    (ii) her mother's age
    after 5 years.
(b) If May's mother's age will be 7 years more than 2 times May's age after 3 years, find their present age.

There are some marbles in a blue bag and a red bag, and the number of marbles in the blue bag is 2 times that of the red bag. If 6 marbles are taken out from the blue bag and put into the red bag, the number of marbles in the blue bag will be 3 more than half that of the red bag. Find the total number of marbles in two bags.

$1000 is divided among Tom, Dick and Flora. Tom gets $200 more than twice the amount Dick gets and Flora gets $100 less than 3 times the amount Dick gets. How much does each of them get?

Solve the literal equation $3(a - bx) = 4x$ for x.

Solve the literal equation $\dfrac{ax}{b} + 1 = c$ for x.

Solve the literal equation $4q - \dfrac{p - s}{2} = 6r$ for s.

Solve the literal equation $\dfrac{ry - s}{u} = 2y$ for y.

Solve the literal equation $p[3(q - z) - r] = tz$ for z.

It is given that $ab = 2$ and $a + b = \dfrac{7}{2}$. Solve the equation $\dfrac{x}{a} + \dfrac{x}{b} = 12$ for x.

The lengths of two trains A and B are 150 m and 180 m respectively, and they leave the station at the same time towards the same direction. If their speeds are 18 m/s and 16 m/s respectively, find the time taken by train A such that it overtakes train B.

(a) (i) Solve the equation $(x-1) + 2(x-2) + 3(x-3) + 4(x-4) = -10 - 5(x-5)$.

(ii) Solve the equation $(x-1) + 2(x-2) + 3(x-3) + 4(x-4) + 5(x-5) = -28 - 6(x-6)$.

(b) Hence, by guessing and checking, find the solution of

$$\left(\frac{2}{y} - 1\right) + 2\left(\frac{2}{y} - 2\right) + 3\left(\frac{2}{y} - 3\right) + \ldots + 6\left(\frac{2}{y} - 6\right) = -56 - 7\left(\frac{2}{y} - 7\right).$$

In a three-digit number, the hundreds digit is 1 less than the tens digit and the units digit is 4 less than 2 times of the tens digit. If the hundreds digit and the units digit are reversed, the number will be increased by 198. Find the number.

There are 20 questions in a game, a player can get 5 marks if he gets a correct answer, 1 mark will be deducted if he has not answered the question and 3 marks will be deducted if he gets a wrong answer.
(a) Peter gets 72 marks and he has not answer 2 questions, find the number of correct answers he gets.
(b) Is it possible that the following situation happens? Why?
    'Thomas gets 0 marks and he says he has answered all the questions.'

(a) Solve the equation $\dfrac{1}{2}\left\{\dfrac{1}{2}\left[\dfrac{1}{2}\left(\dfrac{1}{2}x-2\right)-2\right]-2\right\}-2=9$.

(b) By the result obtained in (a), solve the equation
$\{\{[(x+2)2+2]2+2\}2+2\}2=204$.

(c) Hence, by guessing and checking, find the solution of
$2^2+2^3+2^4+2^5=x^2-16x+123$.

Solve the equation $4s - 2 = 30$.

A. $s = \dfrac{15}{2}$

B. $s = 7$

C. $s = 8$

D. $s = \dfrac{19}{2}$

Solve the literal equation $\dfrac{lx}{2} - \dfrac{mx}{3} = 2$ for x.

A. $x = \dfrac{12}{l - m}$

B. $x = 2\left(\dfrac{2}{l} - \dfrac{3}{m}\right)$

C. $x = \dfrac{6}{l - m}$

D. $x = \dfrac{12}{3l - 2m}$

Solve the equation $5\left(\dfrac{x}{4} + 6\right) = 40$.

A. $x = 8$

B. $x = 12$

C. $x = 16$

D. $x = 64$

Solve the equation $0.2x + 3.5 = 4.7$.

A. $x = 0.24$

B. $x = 1.64$

C. $x = 6$

D. $x = 20$

Solve the equation $3(2 + a) - 1 = 20$.

A. $a = 2$

B. $a = 5$

C. $a = 15$

D. $a = 22$

Solve the equation $1 - \dfrac{1+m}{6} = -\dfrac{2}{3}$.

A. $m = -9$
B. $m = 4$
C. $m = 9$
D. $m = 14$

Which of the following equations does not have the solution $x = -4$?
A. $3x + 10 = -2$
B. $4 - 7x = 32$
C. $-2x - 7 = -1$
D. $-\dfrac{x}{2} + 5 = 7$

Which of the following equations has the same solution as $3x - 5 = 19$?
A. $x + 8 = 0$
B. $9 + 2x = 23$
C. $7x + 44 = 16$
D. $15 - \dfrac{3}{2}x = 3$

Which of the following are like terms in the equation $x + xy + 3x + y = 4$?
A. x and xy
B. xy and y
C. x and y
D. x and $3x$

Which of the following can be solved by combining like terms?
I. $1 = \dfrac{x}{2} - \dfrac{2}{3}$
II. $6x - 4 = 3 + 5x$
III. $3\left(\dfrac{x}{2} + 1\right) = x$

A. III only
B. I and II only
C. I and III only
D. II and III only

Which of the following techniques help simplify the equation $3y = y - 2$?

I. transposition of terms
II. combining like terms
III. cancelling denominators
A. I only
B. II only
C. III only
D. I and II only

Which of the following equations has the same solution as $9 + 4a = a - 1$?

A. $3a = 8$
B. $3a = -10$
C. $5a = 8$
D. $5a = -10$

Solve the equation $6(x - 7) = 5(5x + 3)$.

A. $x = 0$
B. $x = -3$
C. $x = -6$
D. $x = -\dfrac{3}{2}$

Solve the equation $\dfrac{x}{2} + \dfrac{x}{3} = 10$.

A. $x = 12$
B. $x = 15$
C. $x = 30$
D. $x = 60$

Solve the equation $0.2r - 0.05 = \dfrac{r}{10} - 0.02$.

A. $r = 0.1$
B. $r = 0.3$
C. $r = 0.5$
D. $r = 0.7$

Solve the equation $\dfrac{3-b}{10} = 1 + \dfrac{b}{4}$.

A. $b = -2$
B. $b = -1$
C. $b = 2$
D. $b = 4$

The expression $\dfrac{x-1}{8} + \dfrac{5x}{12}$ can be simplified to

A. $\dfrac{6x-1}{8}$.

B. $\dfrac{6x-1}{12}$.

C. $\dfrac{6x-1}{24}$.

D. $\dfrac{13x-3}{24}$.

Solve the equation $(2x+1) - (5x-2) = 5(x-1)$.

A. $x = -1$

B. $x = -\dfrac{1}{2}$

C. $x = 1$
D. $x = 2$

Solve the equation $\dfrac{1}{8}[3(2x-1) + 1] = -\dfrac{5}{2}$.

A. $x = -\dfrac{1}{4}$

B. $x = -3$
C. $x = 3$
D. $x = 4$

Solve the equation $\dfrac{y+2}{5} - \dfrac{3(y-3)}{10} = \dfrac{1}{4}$.

A. $y = \dfrac{27}{2}$

B. $y = \dfrac{21}{2}$

C. $y = -\dfrac{11}{2}$

D. $y = -\dfrac{9}{2}$

When 60 is added to 4 times p, the result is 160. Find the value of p.
A.   10
B.   20
C.   25
D.   35

If x divided by 3 minus 5 equals $\dfrac{1}{8}$ of x, the value of x is

A.   1.
B.   3.
C.   8.
D.   24.

The lengths of the upper base, the lower base and the height of a trapezium are $\dfrac{1}{2}x$ cm, $(x-3)$ cm and 8 cm respectively. If the area of the trapezium is 108 cm^2, the length of its upper base is
A.   6 cm.
B.   10 cm.
C.   18 cm.
D.   20 cm.

The sum of the digits of a two-digit number is 10. If 18 is added to this number, the tens and the units digit of the number are reversed. Find the number.
A.   28
B.   37
C.   46
D.   19

The sum of three numbers x, y and z is 210. If x is half of y and z is 15 less than y, find the value of x.

A.   45
B.   75
C.   90
D.   100

Ann is now n years old and her father is 30 years older than her. If her father's age was 6 years less than 3 times her age, find the value of n.

A.   12
B.   16
C.   18
D.   20

Solve the literal equation $ax - 6b = c$ for x.

A. $x = a(6b - c)$
B. $x = a(c - 6b)$
C. $x = \dfrac{c - 6b}{a}$
D. $x = \dfrac{6b + c}{a}$

Solve the literal equation $\dfrac{ax - b}{c} = bx$ for x.

A. $x = \dfrac{c - b}{a - b}$
B. $x = \dfrac{b}{a - bc}$
C. $x = b + \dfrac{c}{a - b}$
D. $x = \dfrac{c}{b - a}$

Solve the literal equation $\dfrac{t + 1}{m} = \dfrac{b}{2}$ for t.

A. $t = \dfrac{bm - 2}{2}$
B. $t = \dfrac{bm}{2}$
C. $t = \dfrac{b}{2m} - 2$
D. $t = \dfrac{b - 2m}{2}$

Solve the literal equation $c = \dfrac{a-b}{1-ab}$ for b.

A. $b = \dfrac{a-c}{1-ac}$

B. $b = \dfrac{a-c}{1-c}$

C. $b = \dfrac{a}{1-ac}$

D. $b = \dfrac{a}{1-c} - 1$