

EQUATIONS

1)

Solve for x :

a $2(x + 8) + 5(x - 1) = 6$

$x = -5/7$

b $2(x - 3) + 3(x + 2) = 0$

$x = 0$

2)

c $3(x + 3) - 2(x + 1) = -2$

$x = -9$

d $4(2x - 3) + 2(x + 2) = 2$

$x = 1$

3)

Solve for x :

a $\frac{x}{2} = \frac{3}{7}$

$x = 6/7$

b $\frac{3}{5} = \frac{x}{6}$

$x = 18/5$

c $\frac{x}{5} = \frac{x - 2}{3}$

$x = 5$

4)

d $\frac{x + 1}{3} = \frac{2x - 1}{8}$

$x = -11/2$

e $\frac{2x}{3} = \frac{5 - x}{4}$

$x = 15/11$

f $\frac{3x + 2}{3} = \frac{2x - 5}{2}$

No Solution

Word Problems

1 When seven times a certain number is subtracted from 15, the result is -4 . Find the number.

$x = 19/7$

2 Four times a certain number, minus 5, is equal to 7 more than twice the number. What is the number?

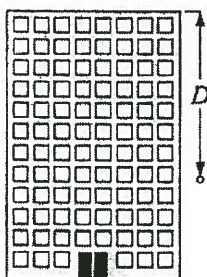
$x = 6$

3 Three times the result of subtracting a certain number from 5 gives the same answer as dividing the number by 3. Find the number.

$x = 9/2$

Substituting Values, Rearranging Formulas

1)



When a cricket ball is dropped from the top of a building the total distance fallen is given by the formula $D = \frac{1}{2}gt^2$ where D is the distance in metres and t is the time taken in seconds. Given that $g = 9.8$, find:

- the total distance fallen in the first 3 seconds of fall
- the height of the building, to the nearest metre, when the time of fall to hit the ground is 5.13 seconds.

a) $D = \frac{1}{2}(9.8)3^2 = 44.1\text{m}$

b) $D = \frac{1}{2}(9.8)5.13^2 = 129\text{m}$

2)

When a car travels a distance d kilometres in time t hours, the average speed s km/h for the journey is given by the formula $s = \frac{d}{t}$. Find:

a the average speed of a car which travels 200 km in $2\frac{1}{2}$ hours

$$200 / 2.5 = 80 \text{ km/h}$$

b the distance travelled by a car in $3\frac{1}{4}$ hours if its average speed is 80 km/h

$$d = st = 80 \times 3.25 = 260 \text{ km}$$

c the time taken, to the nearest minute, for a car to travel 865 km at an average speed of 110 km/h.

$$t = \frac{d}{s} = \frac{865}{110} = 7.86 \text{ hours} \xrightarrow{\times 60 \text{ min}} = 472 \text{ min}$$

3)

2 Make y the subject of:

a $x - 2y = 4 \quad y = \frac{x-4}{2}$

b $2x - 6y = 7 \quad y = \frac{2x-7}{6}$

c $3x - 4y = -12 \quad y = \frac{3x+12}{4}$

d $4x - 5y = 18$

e $7x - 6y = 42$

f $12x - 13y = -44$

$$y = \frac{4x-18}{5}$$

$$y = \frac{7x-42}{6}$$

$$y = \frac{12x+44}{13}$$

Write the letter for the correct answer in the blank at the right of each question.

1. Find the value of $4 + 5[14 - (8 + 3)]$.

A. 27

B. 19

C. 49

D. -46

1. B

2. Evaluate $(a + y)^2 + 2y$ if $a = 5$ and $y = -3$.

A. 58

B. -2

C. 70

D. 10

2. B

3. The formula $S = \frac{n(n+1)}{2}$ can be used to find the sum of the first n natural numbers. Find the sum of the first 20 natural numbers.

A. 210

B. 20

C. 21

D. 190

3. A

4. Simplify $2(x + 3) + 5(2x - 1)$.

A. $12x + 1$

B. $12x + 11$

C. $12x + 2$

D. $9x + 1$

4. A

5. Select the algebraic expression that represents the verbal expression: *the product of nine and a number*

A. $\frac{9}{n}$

B. $9n$

C. $9 - n$

D. $9 + n$

5. B

6. $\frac{1}{2}y = 8$

A. 16

B. 4

C. $\frac{1}{4}$

D. 10

6. A

7. $4(2x - 9) = 3x + 4$

A. -32

B. $-\frac{32}{5}$

C. $\frac{40}{3}$

D. 8

7. D

12. Yoshi is 12 years older than his sister. Six years from now, the sum of their ages will be 32. Find Yoshi's present age.

- A. 10 B. 18 C. 4 D. 16

12. D

13. Two sides of a triangle are equal in length. The length of the third side is three meters less than the sum of the lengths of the other two sides. Find the length of the longest side of the triangle if its perimeter is 29 meters.

- A. 8 m B. 13 m C. $\frac{55}{3}$ m D. 10 m

13. B

Simplify the following.

(a) $11a + 7 + 6a + 5$

$17a + 12$

(b) $5x - 7y - 7x + 3x^2$

$3x^2 - 2x - 7y$

(c) $17y - 3(4y - 7x) + 4(x + 6)$

$17y - 12y + 21x + 4x + 24$

$= 25x - 5y + 24$

(e) Solve for r. $d = rt$

$r = d/t$

(f) Solve for h. $a = \frac{bh}{2}$

$h = \frac{2a}{b}$

Ahmed has a number of coins in a bag. He has 4 times as many 10-cent coins as he does 50-cent coins. If Ahmed has \$6.30 total, how many of each type of coin does he have?

$x(0.5) + 4x(0.1) = 6.30$

$x = 7$ 50 cent
28 10 cent coins

Adam is 20 years younger than Brian. In two years Brian will be twice as old as Adam. How old are they now?

$2(x - 18) = x + 2$

$x = 38$

Find 2 consecutive integers whose sum is 61.

$x + x + 1 = 61$

$x = 30$

Find 3 consecutive odd integers such that the largest is 3 less than twice the smallest.

$2x - 3 = x + 4$

$x = 7$

Find four consecutive odd integers whose sum is 144.

$x + x + 2 + x + 4 + x + 6 = 144$

$4x + 12 = 144$

$4x = 132$

$x = 33$

1. A boy is 10 years older than his brother. In 4 years he will be twice as old as his brother. Find the present age of each.

$$x+4 = 2(x+4) \quad \boxed{x=6}$$

2. A father is 4 times as old as his son. In 20 years the father will be twice as old as his son. Find the present age of each.

$$2(x+20) = 4x+20 \quad \boxed{x=20}$$

3. Pat is 20 years older than his son James. In two years Pat will be twice as old as James. How old are they now?

$$x+22 = 2(x+2) \quad \boxed{x=18}$$

4. Diane is 23 years older than her daughter Amy. In 6 years Diane will be twice as old as Amy. How old are they now?

$$x+29 = 2(x+6) \quad \boxed{x=17}$$

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

$$\boxed{x=5}$$

$$\frac{x}{4} - \frac{1}{6} = \frac{4x-5}{12}$$

$$\boxed{x=3}$$