



# Age Problems

Valued Epistemics Pvt Ltd;  
No.124, 5th Street Padmanabha Nagar, Adyar, Chennai - 600 020. INDIA  
Phone: +91 44 32428730 +91 9884453276  
email: [support@greedge.com](mailto:support@greedge.com)  
[www.GREedge.com](http://www.GREedge.com)



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# TIPS



**While dealing with age problems, it is important to keep in mind that the ages of different people change in the same measure in identical durations of time.**

**For example:**

**After 2 years, all the people mentioned in a given questions will be two years older than what they are now.**

**Four years ago, all of them were four years younger.**

## **Few more Examples:**

**What was the mother's age when her son was born -> same as the age difference between the mother and son (at any time)**

**If the mother was 25 when the son was born: 0, 25  
5 years later, son's age is 5 and mother's age is 30.  
20 years later, son's age is 20 and mother's age is 45.**

**Thus difference between the age of two remains the same.**

**Conversely, if the difference in the ages of two individuals is known then the age of the older person when the younger person was born will be equal to the difference in their ages.**

**Example: The difference in the present age of a Bob and Andrew is 15 years and Bob is older than Andrew.**

**It implies that Bob was 15 when Andrew was born.**

**Also, it is easier if we make use of a table to capture:**

- “ **current**” ages of people mentioned in the question,
- “ **future** ” ages (*a number of years from now*),
- “ **past** ” ages (*a number of years ago*)

**If possible, represent the youngest present age by a single letter and then represent the other ages in terms of this letter.**

## Example-1

**John is 20 years older than Steve. After 10 years, Steve's age will be half that of John's. What is Steve's age?**

- (A) 2**
- (B) 8**
- (C) 10**
- (D) 20**
- (E) 25**



## **Explanation:**

**Steve's present age is the most unknown quantity.  
So we let  $x$  = Steve's age and  
then  $x + 20$  = John's age.**

**Ten years from now,  
Steve and John's ages will be  $x + 10$  and  $x + 30$ ,  
respectively.**

**Summarizing this information in a table yields**



	Age now	Age in 10 years
Steve	$x$	$x + 10$
John	$x + 20$	$x + 30$

**Since "after 10 years, Steve's age will be half that of John's,"**

**we get ,**

$$(x + 30)/2 = x + 10$$

$$x + 30 = 2(x + 10)$$

$$x + 30 = 2x + 20$$

$$x = 10$$

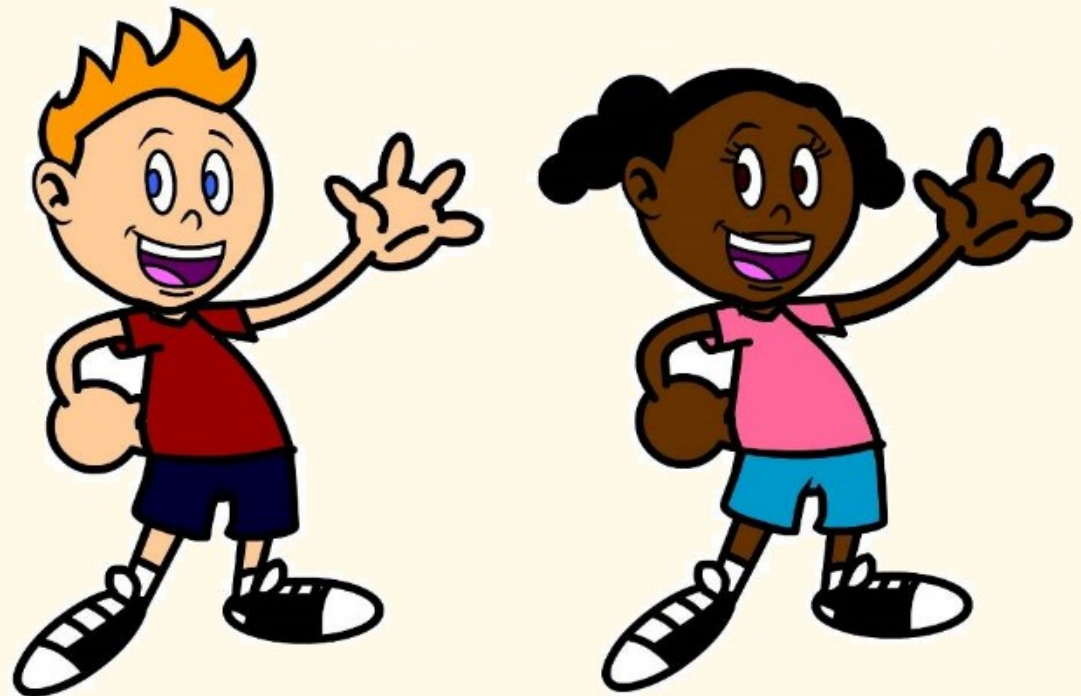
**Hence, Steve is 10 years old, and the answer is (C).**

## Example-2

**Steven is 12 years older than Mary. 3 years ago, Steven was 5 times as old as Mary.**

**How old is Mary?**

- (A) 6
- (B) 8
- (C) 12
- (D) 18
- (E) 23



## Explanation:

Let Mary's present age =  $m$   
and Steven's present age =  $s$

Steven is 12 years older than Mary .

So  $s = 12 + m$  ----- (1)

3 years ago, Steven was 5 times as old as Mary.

$$s - 3 = 5(m - 3)$$

$$s - 3 = 5m - 15$$

$$s = 5m - 12$$
 ----- (2)

Now we have two equations,  
Substitute  $s = 12 + m$  for  $s$  in the equation

$$s = 5m - 12$$

Hence ,

$$12 + m = 5m - 12$$

$$m = 5m - 24$$

$$-4m = -24$$

$$m = 6$$

**So Mary is 6 years old.**

## Example-3

Ethan is as much older than Harry as Harry is older than Candice. Ethan's age five years ago equaled twice the difference that would be between his and Harry's age after 15 years. How old is Candice?

- (A) 4
- (B) 2
- (C) 12
- (D) 5
- (E) 17



## Explanation:

Ethan's age =  $e$

Harry's age =  $h$

Candice's age =  $c$

## First Statement:

Ethan is as much older than Harry as Harry is older than Candice

$$e - h = h - c$$

$$e = 2h - c \text{ ----- (1)}$$

**Second Statement:** *Ethan's age five years ago equaled twice the difference that would be between his and Harry's age after 15 years.*

$$e - 5 = 2[(e + 15) - (h + 15)]$$

Now we have two equations,

$$e - 5 = 2[(e + 15) - (h + 15)]$$

$$e - 5 = 2[(e + 15 - h - 15)]$$

$$e - 5 = 2(e - h)$$

$$e - 5 = 2e - 2h$$

$$-e = -2h + 5$$

$$e = 2h - 5 \text{ ----- (2)}$$



$$e = 2h - c \text{ ----- (1)}$$

$$e = 2h - 5 \text{ ----- (2)}$$

From equation (1) and (2) , we get

$$2h - c = 2h - 5$$

$$\Rightarrow -c = -5$$

$$\Rightarrow c = 5$$

**Hence Candice is 5 years old**

## Example-4



**Susan is sixteen years older than Bob, and next year she will be twice as old as Bob.  
How old are they now?**

- (A) Bob is 15 years and Susan is 31 years of age.**
- (B) Bob is 10 years and Susan is 26 years of age.**
- (C) Bob is 11 years and Susan is 27 years of age.**
- (D) Bob is 16 years and Susan is 32 years of age.**
- (E) Bob is 12 years and Susan is 28 years of age.**

## **Explanation:**

**Let 's' stand for Susan's present age and  
'b' stand for Bob's present age.**

**Susan is 16 years older than Bob, the equation can be  
written as**

$$s = 16 + b \text{ ----- (1)}$$

**Next year Susan will be  $s+1$  years and Bob will be  $b + 1$   
years**

**"next year Susan will be twice as old as Bob" can be  
written in equation form as**

$$s + 1 = 2 (b + 1) \text{ ----- (2)}$$

**solving both equations**

$$s = 16 + b$$

$$s + 1 = 2(b + 1)$$

$$16 + b + 1 = 2(b + 1)$$

$$b + 17 = 2b + 2$$

$$17 - 2 = 2b - b$$

$$\Rightarrow b = 15$$

$$\text{and } s = 16 + b = 16 + 15 = 31$$

**Hence Bob is 15 years and Susan is 31 years of age.**



## Example-5

Five years ago the age of a father was twice the age of his son. The sum of their present ages is 55 years. The present age difference between father and the son will be \_\_\_\_\_.



## **Explanation:**

**The age of the Son, 5 years ago =  $x$  years**

**Age of the father 5 years ago =  $2x$  years**

**Present ages of son and father respectively are  $(x+5)$  years and  $(2x+5)$  years.**

**Given that, sum of their present ages = 55 years**

**Therefore ,**

$$(x+5)+(2x+5) = 55$$

$$3x + 10 = 55$$

$$3x = 55 - 10$$

$$3x = 45$$

$$x = 45/3$$

$$x = 15$$

**So Son's present age is  $x+5= 15+5 = 20$  year**  
**Father's present age is  $2x+5 = 35$  year**

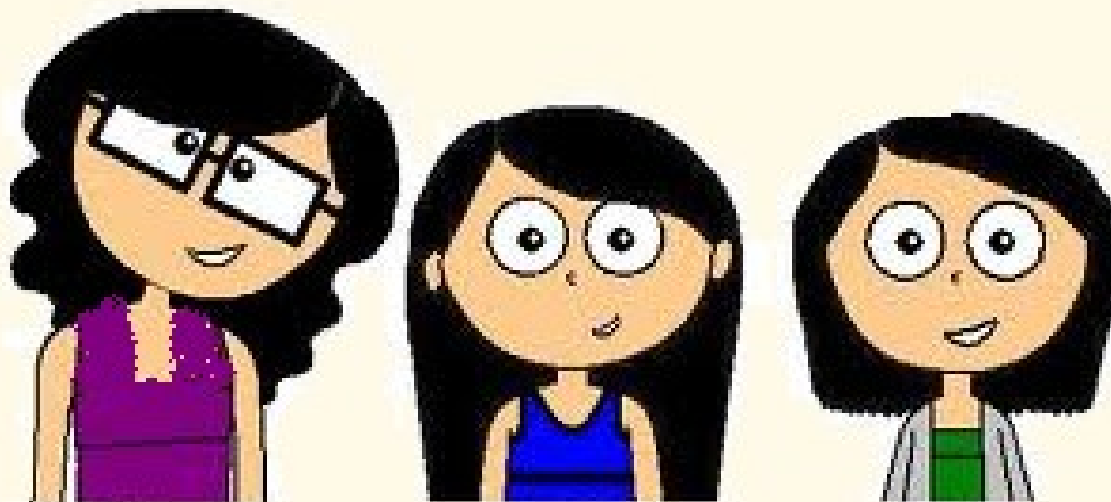
**So the difference between their present age will be**

$$35 - 20 = 15$$

**Hence the difference between their present age will be 15 years.**

## Example-6

Emma is nine years older than Kate. Emma was four times as old as Betsy was three years ago. Betsy is eighteen years younger than Emma. Kate's age will be \_\_\_\_\_.





## **Explanation:**

Let 'e' be the present age of Emma and 'k' and 'b' be the current ages of Kate and Betsy respectively.

"Emma is nine years older than Kate" can be written as  
 $e = k + 9$

"Emma was four times as old as Betsy was three years ago" can be written as:  $e - 3 = 4(b-3)$

"Betsy is eighteen years younger than Emma" can be written as:  $b = e - 18$

$$e = k + 9 \text{ ----- (1)}$$

$$e - 3 = 4(b - 3) \text{ ---- (2)}$$

$$b = e - 18 \text{ ----- (3)}$$

**Here we have to find out the value of k.**

**substituting  $b = e - 18$  in the equation  $e - 3 = 4(b - 3)$**

$$e - 3 = 4(e - 18 - 3)$$

$$e - 3 = 4(e - 21)$$

$$e - 3 = 4e - 84$$

$$3e = 81$$

$$e = 81/3 = 27$$

$$b = e - 18 = 27 - 18 = 9$$

$$\begin{aligned}e &= k + 9 \\ \Rightarrow 27 &= k + 9 \\ \Rightarrow k &= 27 - 9 \\ \Rightarrow k &= 18\end{aligned}$$

**Emma is 27 years old, Betsy is 9 years and Kate is 18 years old.**

**Hence, Kate's age will be 18 years.**

## Example-7

The age of the father is 4 years more than three times the age of son. Three years hence, father's age will be 16 years more than twice the age of his son. The difference between their present ages will be \_\_\_\_\_.



## **Explanation:**

**Let the present age of son =  $x$  years**

**Father's age =  $3x + 4$  years**

**Three years hence,  
son's age =  $x + 3$  years**

**Father's age =  $3x + 4 + 3$   
=  $3x + 7$  years**

**Three years hence, father's age will be 16 years more than twice the age of his son.**

$$3x + 7 = 2(x + 3) + 16$$

$$3x + 7 = 2x + 6 + 16$$

$$3x - 2x = 6 + 16 - 7$$

$$x = 15$$

$$3x + 4 = 3 \times 15 + 4 = 49$$

**The son's age is 15 years and father's age = 49 years .**

$$\text{Difference between their present age} = 49 - 15 = 34$$

**So the difference between their present age will be 34 years.**

## Example-8



**If 3 times Jane's age, in years, is equal to 8 times Beth's age, in years, and the difference between their ages is 15 years.**

**Column A: Jane's age**

**Column B: Beth's age**

**(A) Column A is Greater than Column B**

**(B) Column B is Greater than Column A**

**(C) Both Columns are same.**

**(D) Relationship can't be determined.**



## **Explanation:**

**Let jane and beth age be J and B.**

**3 times Jane's age, in years, is equal to 8 times Beth's age, in years**

$$\text{So } 3J = 8B$$

**The difference between their ages is 15 years**

$$J - B = 15$$

**Solving the 2 simultaneous equations,**

**$3J = 8B$  and  $J - B = 15$ , We get**

**$J = 24$  and  $B = 9$ .**

**Hence Column A is Greater than Column B.**



## Example-9

**In January of the year 2000, I was one more than eleven times as old as my son William. In January of 2009, I was seven more than three times as old as him.**

**The age of my son in January of 2000 was \_\_\_\_\_?**



## Explanation:

Let "E " stand for my age in 2000, and  
let "W " stand for William's age.

Then  $E = 11W + 1$  ----- (1) in the year 2000

(from "eleven times as much, plus another one").

In the year 2009 (nine years after the year 2000), William  
and I will each be nine years older,  
so our ages will be  $E + 9$  and  $W + 9$ .

Also, I was seven more than three times as old as William  
was,

$$\begin{aligned}\text{so } E + 9 &= 3(W + 9) + 7 \\ &= 3W + 27 + 7 \\ &= 3W + 34. \text{ ----- (2)}\end{aligned}$$

**This gives you two equations, each having two variables:**

$$E = 11W + 1$$

$$E + 9 = 3W + 34$$

**since  $E = 11W + 1$ , plug " $11W + 1$ " in the second equation:**

$$E + 9 = 3W + 34$$

$$(11W + 1) + 9 = 3W + 34$$

$$11W - 3W = 34 - 9 - 1$$

$$8W = 24$$

$$W = 3$$

**Hence William was 3 years old in January of 2000.**

## Example-10



**In three more years Mike's grandfather will be six times as old as Mike was last year. When Mike's present age is added to his grandfather's present age, the total is 68.**

**Column A: Grand father's age**

**Column B: 57**

**(A) Column A is Greater than Column B**

**(B) Column B is Greater than Column A**

**(C) Both Columns are same.**

**(D) Relationship can not be determined.**

## Explanation:

Let Mike's present age as "m"  
and his grandfather's present age as "g".

Then  $m + g = 68$ . ----- (1)

Mike's age "last year" was  $m - 1$ .  
His grandfather's age "in three more years" will be  $g + 3$ .

The grandfather's "age three years from now" is six  
times Mike's "age last year" or, in math:  
 $g + 3 = 6(m - 1)$  ----- (2)

This gives two equations with two variables:

$$m + g = 68$$

$$g + 3 = 6(m - 1)$$

**Solving the first equation,  
we get  $m = 68 - g$ .**

**(Note: It's okay to solve for " $g = 68 - m$ ", too. The  
problem will work out a bit differently in the middle, but  
the answer will be the same at the end.)**

**Plug " $68 - g$ " into the second equation in place of " $m$ ":**

$$g + 3 = 6m - 6$$

$$g + 3 = 6(68 - g) - 6$$

$$g + 3 = 408 - 6g - 6$$

$$g + 3 = 402 - 6g$$

$$g + 6g = 402 - 3$$

$$7g = 399$$

$$g = 57 \text{ (Grand father's age)}$$

**Hence the both Columns are same.**



## Example-11

One-half of Heather's age two years from now plus one-third of her age three years ago is twenty years. Heather's present age is \_\_\_\_\_.



## Explanation:

This problem refers to Heather's age two years in the future and three years in the past. So we will pick a variable and label everything clearly:

Let Heather's present age be  $H$

age two years from now :  $H + 2$

age three years ago:  $H - 3$

Now we need certain fractions of these ages:

$$\begin{aligned} \text{one-half of age two years from now: } & \left(\frac{1}{2}\right)(H + 2) \\ = & H/2 + 1 \end{aligned}$$

$$\text{one-third of age three years ago: } \left(\frac{1}{3}\right)(H - 3) = H/3 - 1$$



The sum of these two numbers is twenty,  
so we will add them and set this equal to 20:

$$H/2 + 1 + H/3 - 1 = 20$$

$$H/2 + H/3 = 20$$

$$3H + 2H = 120$$

$$5H = 120$$

$$H = 24$$

**So Heather is 24 years old now.**

## Example-12

**Q is as much younger than R as he is older than T.  
If the sum of the ages of R and T is 50 years, what is  
definitely the difference between R and Q's age?**

- A. 1 year**
- B. 2 years**
- C. 25 years**
- D. Data inadequate**
- E. None of these**



**Given that:**

**1. The difference of age between R and Q = The difference of age between Q and T.**

**2. Sum of age of R and T is 50  
i.e.  $(R + T) = 50$ .**

**Here we have to find out  $R - Q = ?$ .**

## Explanation:

$$\begin{aligned} R - Q &= Q - T \\ \Rightarrow R + T &= 2Q \text{ ----- (1)} \end{aligned}$$

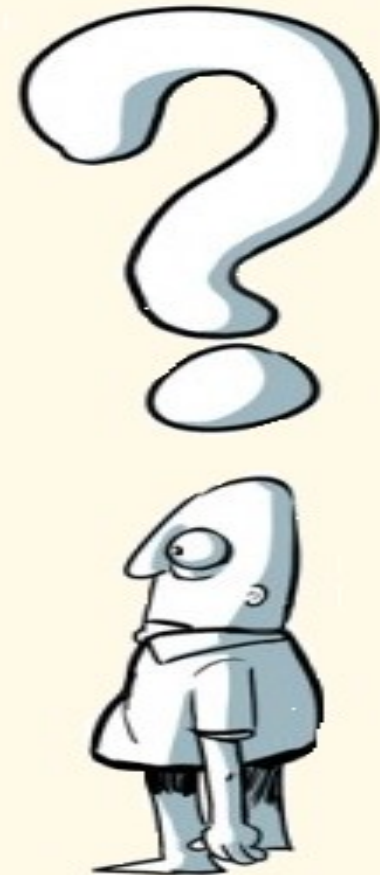
$$\text{Now given that, } (R + T) = 50 \text{ ----- (2)}$$

$$\begin{aligned} \text{So from equation (1 and (2), We get,} \\ 2Q &= 50 \\ \Rightarrow Q &= 25. \end{aligned}$$

Question is  $(R - Q) = ?$

Here we know the value(age) of Q (25), but we don't know the ages of R and T .

**Therefore,  $(R - Q)$  cannot be determined. So D be the answer.**



## Example-13

The age of father 10 years ago was thrice the age of his son. Ten years hence, father's age will be twice that of his son. The ratio of the present ages of father and son is:

- A. 5 : 2
- B. 7 : 3
- C. 9 : 2
- D. 13 : 4



## **Explanation:**

**Let the ages of father and son 10 years ago be  $3x$  and  $x$  years respectively.**

**Present age of father and son will be  $3x+10$  and  $x+10$  years respectively.**

**Ten years hence, father's age will be twice that of his son**

$$\begin{aligned}\text{Then, } (3x + 10) + 10 &= 2[(x + 10) + 10] \\ 3x + 20 &= 2x + 40 \\ x &= 20.\end{aligned}$$

**Required ratio**

$$= (3x + 10) : (x + 10)$$

$$= 70 : 30$$

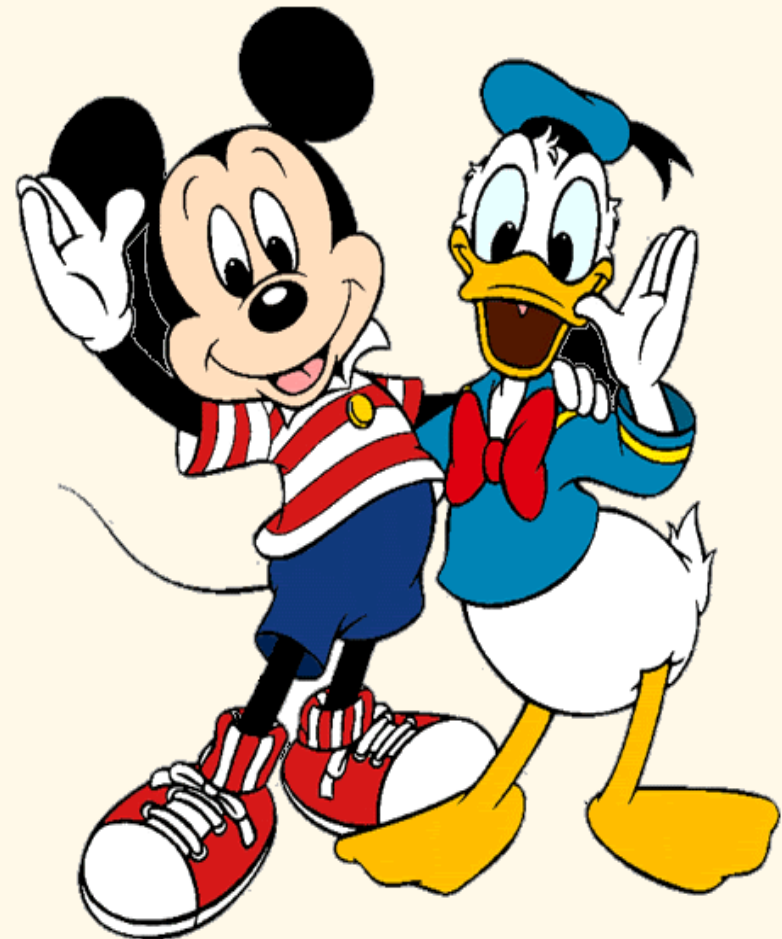
$$= 7 : 3$$

**Hence The ratio of the present ages of father and son is 7:3**

## Example-14

**Six years ago, the ratio of the ages of Micky and Donald was 6 : 5. Four years hence, the ratio of their ages will be 11 : 10. What is Donalds's age at present?**

- A.16 years**
- B.18 years**
- C.20 years**
- D. Cannot be determined**
- E. None of these**





## Explanation:

Let the ages of Micky and Donald 6 years ago be  $6x$  and  $5x$  years respectively.

Present age of Micky is  $6x + 6$ .

Present age of Donald is  $5x + 6$ .

Four years hence, the ratio of their ages will be  $11 : 10$

$$\text{Then, } \frac{(6x + 6) + 4}{(5x + 6) + 4} = \frac{11}{10}$$

$$10(6x + 10) = 11(5x + 10)$$

$$60x - 55x = 110 - 100$$

$$5x = 10$$

$$x = 2.$$

Hence Donald's present age =  $(5x + 6) = 16$  years.

## Example-15



**The sum of the present ages of a father and his son is 60 years. Six years ago, father's age was five times the age of the son. After 6 years, son's age will be:**

**(A) 12 years**

**(B) 14 years**

**(C) 18 years**

**(D) 20 years**



## **Explanation:**

**Let the present ages of son and father be  $x$  and  $(60 - x)$  years respectively.**

**Six years ago, father's age was five times the age of the son**

$$\text{Then, } (60 - x) - 6 = 5(x - 6)$$

$$54 - x = 5x - 30$$

$$6x = 84$$

$$x = 14.$$

**Son's age after 6 years =  $(x + 6) = 20$  years.**

**Hence after 6 years, son's age will be 20 years .**

## Example-16

**Present ages of Samy and Antony are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their ages will become 11 : 9 respectively. What is Antony's present age in years?**

- A. 40 years**
- B. 27 years**
- C. 24 years**
- D. Cannot be determined**
- E. None of these**



## Explanation:

Let the present ages of Samy and Antony be  $5x$  years and  $4x$  years respectively.

Three years hence, the ratio of their ages will become  $11 : 9$  respectively.

Then

$$\frac{5x + 3}{4x + 3} = \frac{11}{9}$$

$$9(5x + 3) = 11(4x + 3)$$

$$45x + 27 = 44x + 33$$

$$45x - 44x = 33 - 27$$

$$x = 6$$

Hence Antony's present age =  $4x = 24$  years.



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