

Essential Question: How can we set up an equation to solve problems about age?

Do Now:

- a) Brandon is 14 years old. What will be his age in 6 years?  $20$
- b) Tom is  $x$  years old. What will be his age in 6 years?  $x + 6$
- c) Vicki is  $y$  years old. What was her age 2 years ago?  $y - 2$
- d) Pete is 1 year older than twice his sister's age. Represent each of their ages in the table below.

	now	in 5 years +5
Pete's age	$2x + 1$	$2x + 1 + 5$ $2x + 6$
Sister's age	$x$	$x + 5$

### Age Problems

When solving age problems, represent the following in terms of a variable:

- the present ages of all people
- the age, at the other specified time (past/future), of all people

Use the relationships described in the problem to write an equation.

Solve the equation and answer the question.

For example:

Phil is 35 years old. Three years ago, Phil was four times as old as his son was then. How old is his son now?

	now	3 years ago
Phil's age	35	32
Son's age	$t$	$t - 3$

Three years ago Phil was four times as old as his son was then.

$$32 \cong 4 \text{ times } (t-3)$$

$$32 = 4(t-3)$$

$$\frac{32}{4} = \frac{4(t-3)}{4}$$

$$8 = t - 3$$

$$11 = t$$

His son is 11 years old now.

1. Bill is three times as old as Pete. Six years from now Bill will be twice as old as Pete will be. How old are they now?

	now	future +6
Pete's age	$x$	$x+6$
Bill's age	$3x$	$3x+6$

$$\begin{aligned} \text{Bill's future age} &= \\ &= 2(\text{Pete's future age}) \end{aligned}$$

$$3x+6 = 2(x+6)$$

$$3x+6 = 2x+12$$

$$x+6 = 12$$

$$x = 6$$

Pete : 6 years  
Bill : 18 years

2. Ali's age plus her Dad's age is 50. In 8 years Ali's dad will be twice as old as she is. Find their ages now.

	now	future <sup>+8</sup>
Ali	$x$	$x+8$
Dad	$50-x$	$50-x+8$ $58-x$

$$\text{Ali's dad future age} = 2(\text{Ali's future age})$$

$$58-x = 2(x+8)$$

$$58-x = 2x+16$$

$$42-x = 2x$$

$$42 = 3x$$

$$x = 14$$

Ali : 14 years old  
Dad : 36 years old

3. Sue is 20 years old and Anne is 10 years old. How many years ago was Sue 3 times as old as Anne?

	now	past <sup>-x</sup>
Sue	20	$20-x$
Anne	10	$10-x$

$$\text{Sue's past age} = 3(\text{Anne's past age})$$

$$20-x = 3(10-x)$$

$$\begin{aligned} 20-x &= 30-3x \\ +3x & \quad +3x \end{aligned}$$

$$\begin{aligned} 20+2x &= 30 \\ -20 & \quad -20 \end{aligned}$$

$$2x = 10$$

$$x = 5$$

5 years ago