

1.9

- 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.

	Now	+4
H-boy	$x+10$	$x+14$
B-Brother	x	$x+4$

$$\begin{aligned}
 H &= 2B \\
 (x + 14) &= 2(x + 4) \\
 x + 14 &= 2x + 8 \\
 \underline{-x \quad -x} & \\
 14 &= x + 8 \\
 \underline{-8 \quad -8} & \\
 6 &= x
 \end{aligned}$$

Boy: 16, Brother: 6

- 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?

	Now	+2
P	$x+20$	$x+22$
J	x	$x+2$

$$\begin{aligned}
 P &= 2J \\
 x + 22 &= 2(x + 2) \\
 x + 22 &= 2x + 4 \\
 \underline{-x \quad -x} & \\
 22 &= x + 4 \\
 \underline{-4 \quad -4} & \\
 18 &= x
 \end{aligned}$$

Pat: 38, James: 18

- 5) Fred is 4 years older than Barney. Five years ago the sum of their ages was 48. How old are they now?

	Now	-5
F	$x+4$	$x-1$
B	x	$x-5$

$$\begin{aligned}
 F + B &= 48 \\
 (x - 1) + (x - 5) &= 48 \\
 2x - 6 &= 48 \\
 \underline{+6 \quad +6} & \\
 \frac{2x}{2} &= \frac{54}{2} \\
 x &= 27
 \end{aligned}$$

Fred: 31, Barney: 27

- 7) Tim is 5 years older than JoAnn. Six years from now the sum of their ages will be 79. How old are they now?

	Now	+6
T	$x+5$	$x+11$
J	x	$x+6$

$$\begin{aligned}
 T + J &= 79 \\
 (x + 11) + (x + 6) &= 79 \\
 2x + 17 &= 79 \\
 \underline{-17 \quad -17} & \\
 \frac{2x}{2} &= \frac{62}{2} \\
 x &= 31
 \end{aligned}$$

Tim: 36, JoAnn: 31

- 9) The sum of the ages of John and Mary is 32. Four years ago, John was twice as old as Mary. Find the present age of each.

	Now	-4
J	x	$x-4$
M	$32-x$	$28-x$

$$\begin{aligned}
 J &= 2m \\
 (x - 4) &= 2(28 - x) \\
 x - 4 &= 56 - 2x \\
 +2x &\quad +2x \\
 \hline
 3x - 4 &= 56 \\
 +4 &\quad +4 \\
 \hline
 \frac{3x}{3} &= \frac{60}{3} \\
 x &= 20
 \end{aligned}$$

John: 20, Mary: 12

- 11) The sum of the ages of a china plate and a glass plate is 16 years. Four years ago the china plate was three times the age of the glass plate. Find the present age of each plate.

	Now	-4
C	x	$x-4$
G	$16-x$	$12-x$

$$\begin{aligned}
 C &= 3G \\
 (x - 4) &= 3(12 - x) \\
 x - 4 &= 36 - 3x \\
 +3x &\quad +3x \\
 \hline
 4x - 4 &= 36 \\
 +4 &\quad +4 \\
 \hline
 \frac{4x}{4} &= \frac{40}{4} \\
 x &= 10
 \end{aligned}$$

China: 10, Glass: 6

- 13) A is now 34 years old, and B is 4 years old. In how many years will A be twice as old as B?

	Now	+t
A	34	$34+t$
B	4	$4+t$

$$\begin{aligned}
 A &= 2B \\
 34 + t &= 2(4 + t) \\
 34 + t &= 8 + 2t \\
 -t &\quad -t \\
 \hline
 34 &= 8 + t \\
 -8 &\quad -8 \\
 \hline
 26 &= t
 \end{aligned}$$

- 15) An Oriental rug is 52 years old and a Persian rug is 16 years old. How many years ago was the Oriental rug four times as old as the Persian Rug?

	Now	-t
O	52	$52-t$
P	16	$16-t$

$$\begin{aligned}
 O &= 4P \\
 52 - t &= 4(16 - t) \\
 52 - t &= 64 - 4t \\
 +4t &\quad +4t \\
 \hline
 52 + 3t &= 64 \\
 -52 &\quad -52 \\
 \hline
 \frac{3t}{3} &= \frac{12}{3} \\
 t &= 4
 \end{aligned}$$

- 17) The age of the older of two boys is twice that of the younger; 5 years ago it was three times that of the younger. Find the age of each.

	Now	-5
O	2x	2x-5
Y	x	x-5

$$\begin{aligned}
 O &= 3Y \\
 2x - 5 &= 3(x - 5) \\
 2x - 5 &= 3x - 15 \\
 \underline{-2x \quad - 2x} & \\
 -5 &= x - 15 \\
 \underline{+15 \quad +15} & \\
 10 &= x
 \end{aligned}$$

Older: 20, Younger: 10

- 19) Marge is twice as old as Consuelo. The sum of their ages seven years ago was 13. How old are they now?

	Now	-7
M	2x	2x-7
C	x	x-7

$$\begin{aligned}
 M + C &= 13 \\
 (2x - 7) + (x - 7) &= 13 \\
 3x - 14 &= 13 \\
 \underline{+14 \quad +14} & \\
 \frac{3x}{3} &= \frac{27}{3} \\
 x &= 9
 \end{aligned}$$

Marge: 18, Consuelo: 9

- 21) A silver coin is 28 years older than a bronze coin. In 6 years, the silver coin will be twice as old as the bronze coin. Find the present age of each coin.

	Now	+6
S	x+28	x+34
B	x	x+6

$$\begin{aligned}
 S &= 2B \\
 (x + 34) &= 2(x + 6) \\
 x + 34 &= 2x + 12 \\
 \underline{-x \quad - x} & \\
 34 &= x + 12 \\
 \underline{-12 \quad - 12} & \\
 22 &= x
 \end{aligned}$$

Silver: 50, bronze: 22

- 23) A limestone statue is 56 years older than a marble statue. In 12 years, the limestone will be three times as old as the marble statue. Find the present age of the statues.

	Now	+12
L	x+56	x+68
M	x	x+12

$$\begin{aligned}
 L &= 3M \\
 (x + 68) &= 3(x + 12) \\
 x + 68 &= 3x + 36 \\
 \underline{-x \quad - x} & \\
 68 &= 2x + 36 \\
 \underline{-36 \quad - 36} & \\
 \frac{32}{2} &= \frac{2x}{2} \\
 16 &= x
 \end{aligned}$$

Limestone: 72, Marble: 16

25) Brandon is 9 years older than Ronda. In four years the sum of their ages will be 91. How old are they now?

	Now	+4
B	$x+9$	$x+13$
R	x	$x+4$

$$\begin{aligned}
 B + R &= 91 \\
 (x + 13) + (x + 4) &= 91 \\
 2x + 17 &= 91 \\
 \underline{-17 \quad -17} \\
 \frac{2x}{2} &= \frac{74}{2} \\
 x &= 37
 \end{aligned}$$

Brandon: 46, Ronda: 37

27) A father is three times as old as his son, and his daughter is 3 years younger than the son. If the sum of their ages 3 years ago was 63 years, find the present age of the father.

	Now	-3
F	$3x$	$3x-3$
S	x	$x-3$
D	$x-3$	$x-6$

$$\begin{aligned}
 F + S + D &+ 63 \\
 (3x - 3) + (x - 3) + (x - 6) &= 63 \\
 5x - 12 &= 63 \\
 \underline{+12 \quad +12} \\
 \frac{5x}{5} &= \frac{75}{5} \\
 x &= 15
 \end{aligned}$$

Father: 45, Son = 15, Daughter: 12

29) The sum of the ages of two ships is 12 years. Two years ago, the age of the older ship was three times the age of the newer ship. Find the present age of each ship.

	Now	-2
O	x	$x-2$
Y	$12-x$	$10-x$

$$\begin{aligned}
 O &= 3Y \\
 (x - 2) &= 3(10 - x) \\
 x - 2 &= 30 - x \\
 +x \quad \quad \quad +x \\
 \underline{2x - 2} &= 30 \\
 \underline{+2 \quad +2} \\
 \frac{4x}{4} &= \frac{32}{4} \\
 x &= 8
 \end{aligned}$$

8 & 4

31) Ann is eighteen years older than her son. One year ago, she was three times as old as her son. How old are they now?

	Now	-1
A	$x+18$	$x+17$
S	x	$x-1$

$$\begin{aligned}
 A &= 3S \\
 (x + 17) &= 3(x - 1) \\
 x + 17 &= 3x - 3 \\
 \underline{-x \quad \quad -x} \\
 17 &= 2x - 3 \\
 \underline{+3 \quad \quad +3} \\
 \frac{20}{2} &= \frac{2x}{2} \\
 10 &= x
 \end{aligned}$$

Ann: 28, Son: 10

33) A mosaic is 74 years older than the engraving. Thirty years ago, the mosaic was three times as old as the engraving. Find the present age of each.

	Now	-30
M	$x+74$	$x+44$
E	x	$x-30$

$$\begin{aligned}
 M &= 3E \\
 (x + 44) &= 3(x - 30) \\
 x + 44 &= 3x - 90 \\
 \begin{array}{r} -x \quad -x \\ \hline 44 = 2x - 90 \\ +90 \quad +90 \\ \hline \frac{134}{2} = \frac{2x}{2} \\ 67 = x \end{array}
 \end{aligned}$$

Mosaic: 141, Engraving: 67

35) A wool tapestry is 32 years older than a linen tapestry. Twenty years ago, the wool tapestry was twice as old as the linen tapestry. Find the present age of each.

	Now	-20
W	$x+32$	$x+12$
L	x	$x-20$

$$\begin{aligned}
 W &= 2L \\
 (x + 12) &= 2(x - 20) \\
 x + 12 &= 2x - 20 \\
 \begin{array}{r} -x \quad -x \\ \hline 12 = x - 20 \\ +20 \quad +20 \\ \hline 32 = x \end{array}
 \end{aligned}$$

Wool: 84, Linen: 52

37) Nicole is 26 years old. Emma is 2 years old. In how many years will Nicole be triple Emma's age?

	Now	+t
N	26	$26+t$
E	2	$2+t$

$$\begin{aligned}
 N &= 3E \\
 (26 + t) &= 3(2 + t) \\
 26 + t &= 6 + 3t \\
 \begin{array}{r} -t \quad -t \\ \hline 26 = 6 + 2t \\ -6 \quad -6 \\ \hline \frac{20}{2} = \frac{2t}{2} \\ 10 = t \end{array}
 \end{aligned}$$

39) Mike is 4 years older than Ron. In two years, the sum of their ages will be 84. How old are they now?

	Now	+2
M	$x+4$	$x+6$
R	x	$x+2$

$$\begin{aligned}
 M + R &= 84 \\
 (x + 6) + (x + 2) &= 84 \\
 2x + 8 &= 84 \\
 \begin{array}{r} -8 \quad -8 \\ \hline \frac{2x}{2} = \frac{76}{2} \\ x = 38 \end{array}
 \end{aligned}$$

Mike: 42, Ron: 38