

Quiz Review

① $x = \text{rate in still air}$ $y = \text{rate of wind}$

	r
With	$x+y = 158$
against	$x-y = 112$

* It tells us the rate with and against so we do not need time or distance

$$\begin{array}{r} x+y=158 \\ x-y=112 \\ \hline 2x=270 \\ \hline x=135 \end{array}$$

$$\begin{array}{r} 135+y=158 \\ -135 \quad -135 \\ \hline y=23 \end{array}$$

The rate in still air is 135 km/hr and wind rate is 23 km/hr.

② $t = \text{tens}$ $u = \text{units}$ $10t+u = \text{orig.}$ $10u+t = \text{reverse}$
 $t+u = 7$ $10u+t = 10t+u+9$

$$\begin{array}{r} -10t \quad -10t \\ 10u-9t = u+9 \\ \underline{-u} \quad \underline{-u} \\ 9u-9t = 9 \end{array}$$

$$\begin{array}{l} t+u=7 \\ t=3 \end{array}$$

$$\begin{array}{l} u-t=1 \\ u+t=7 \\ \hline 2u=8 \\ u=4 \end{array}$$

The # is 34

③

	now	Last yr
Ann	A	A-1
Betty	B	B-1

$$A = B + 2$$

$$A - 1 = 2(B - 1)$$

$$\begin{array}{l} A = 3 + 2 \\ A = 5 \end{array}$$

$$\begin{array}{r} B+2-1 = 2B-2 \\ B+1 = 2B-2 \\ -B \quad -B \\ +2 = B-2 \\ \hline 3 = B \end{array}$$

Ann is 5 and Betty is 3

MATHS

④

	NOW	IN 3 YRS
Jerry	X	X+3
Jen	Y	Y+3

$$X = 7 + Y \quad X + 3 = 2(Y + 3)$$

$$\begin{aligned} 7 + Y + 3 &= 2Y + 6 \\ -Y &\quad -Y \\ -10 &= Y + 6 \\ -6 &\quad -6 \\ 4 &= Y \end{aligned}$$

$$\begin{aligned} X &= 7 + 4 \\ X &= 11 \end{aligned}$$

Jerry is 11 and Jen is 4.

- ⑤ X = rate in still air Y = rate of wind d = distance one way
 ↳ given 60

	r	t	d
with	$X + 60$	2	d
against	$X - 60$	3	d

$$2(X + 60) = d \quad 3(X - 60) = d$$

$$\begin{aligned} 2X + 120 &= 3X - 180 \\ -2X &\quad -2X \end{aligned}$$

$$\begin{aligned} +120 &= X - 180 \\ +180 &\quad +180 \end{aligned}$$

$$300 = X$$

$$2(300 + 60) = d$$

$$720 = d$$

Rate in still air is 300 km/hr. Each way dist. is 720 km. Round trip it is 1440 km.

⑥

	NOW	IN 2 YRS
Father	F	F+2
John	J	J+2
Alice	A	A+2

$$F = 5J$$

$$J = 2A$$

$$F = 5(2A)$$

$$F = 10A$$

$$J = 2(4)$$

$$J = 8$$

$$F + 2 + J + 2 + A + 2 = 58$$

$$10A + 2 + 2A + 2 + A + 2 = 58$$

$$\begin{aligned} 13A + 6 &= 58 \\ -6 &\quad -6 \end{aligned}$$

$$13A = 52$$

$$A = 4$$

John is 8

	NOW	11 yrs ago
Man	X	X-11
Son	Y	Y-11

$$\begin{aligned}
 X + Y &= 82 & X - 11 &= 2(Y - 11) \\
 X &= 82 - Y & X - 11 &= 2Y - 22 \\
 82 - Y - 11 &= 2Y - 22 & & \\
 + Y & & + Y & \\
 \hline
 71 &= 3Y - 22 & & \\
 + 22 & & + 22 & \\
 \hline
 93 &= 3Y & & \\
 \frac{93}{3} &= \frac{3Y}{3} & & \\
 31 &= Y & &
 \end{aligned}$$

$$\begin{aligned}
 X &= 82 - 31 \\
 X &= 51
 \end{aligned}$$

Man is 51 and his
son is 31

8) t = tens digit u = units $10t + u$ = orig. $10u + t$ = rev.

$$\begin{aligned}
 t + u &= 14 \\
 -u & -u \\
 \hline
 t &= 14 - u
 \end{aligned}$$

$$\begin{aligned}
 10u + t &= 19t \\
 -t & -t \\
 \hline
 10u &= 18t \\
 \frac{10u}{2} &= \frac{18t}{2} \\
 5u &= 9t
 \end{aligned}$$

$$\begin{aligned}
 t &= 14 - 9 \\
 t &= 5
 \end{aligned}$$

$$\begin{aligned}
 5u &= 9(14 - u) \\
 5u &= 126 - 9u \\
 +9u & & +9u \\
 \hline
 14u &= 126 \\
 u &= 9
 \end{aligned}$$

The # is
59.

9) X = rate still air Y = rate of current

	r	t	d
With	$X + Y$	1.5	900
Against	$X - Y$	2	900

$$\frac{1.5(X + Y)}{1.5} = \frac{900}{1.5} \rightarrow X + Y = 600$$

$$\frac{2(X - Y)}{2} = \frac{900}{2} \rightarrow X - Y = 450$$

$$\frac{2X}{2} = \frac{1050}{2}$$

$$X = 525$$

Rate in still air
is 525 mph.
Rate of wind
is 75 mph.

⑩ $n = \text{hundreds}$ $t = \text{tens}$ $u = \text{units}$
 $100n + 10t + u = \text{orig.}$ $100u + 10t + n = \text{reverse}$

$$n = 2 + 2t \quad t = 2u - 1 \quad 100u + 10t + n = 100n + 10t + u - 594$$

$$n = 2 + 2(2u - 1)$$

$$n = 2 + 4u - 2$$

$$n = 4u$$

~~100n + 10t + n~~

$$100u + 10t + n = 100n + 10t + u - 594$$

$$n = 4(2)$$

$$n = 8$$

$$t = 2u - 1$$

$$t = 2(2) - 1$$

$$t = 3$$

The # is 832.

$$100u + n = 100n + u - 594$$

$$100u = 99n + u - 594$$

$$\frac{99u}{99} = \frac{99n}{99} + \frac{u}{99} - \frac{594}{99}$$

$$u = n + \frac{6}{99}$$

$$u = 4u + \frac{6}{99}$$

$$-4u = -\frac{6}{99}$$

$$u = 2$$

⑪ $x = \text{rate of boat still water}$ $y = \text{rate of current}$

	r	t	d	
with	$x+y$	$\frac{1}{3}$	4	$(\frac{1}{3}(x+y) = 4) \cdot 3 \rightarrow x+y = 12$
against	$x-y$	$\frac{2}{5}$	4	$(\frac{2}{5}(x-y) = 4) \cdot \frac{5}{2} \rightarrow x-y = 10$

$$2x = 22$$

$$x = 11$$

Rate in still water
 is 11 km/hr and
 rate of current is
 1 km/hr.