

B1:

28.2:

Doubling 34: 34, 68, 136, 272, 544

$18 \cdot 34 = 2 \cdot 3416 \cdot 34 = 68 + 544 = 612.$

Doubling 5: 5, 10, 20, 40, 80

$80 + 10 = 90$

$16 + 2 = 18$

So, we get that 5 divides into 93 19 times with remainder 3.

28.4:

$\left(2 + \frac{1}{14}\right) \cdot \left(1 + \frac{1}{2} + \frac{1}{4}\right) = \frac{29}{14} \cdot \frac{7}{4}$

Multiply 29 by 7:

Doubling 29: 29, 58, 116

$116 + 58 + 29 = 203$

Doubling 56: 56, 112

$3 \cdot 56 + 35 = 203$

So, $\frac{203}{56} = 3 + \frac{35}{56}$

28.24:

$1; 24, 51, 10 = 1 + \frac{24}{60} + \frac{51}{60^2} + \frac{10}{60^3} \approx 1.414213$

$\sqrt{2} \approx 1.414214$

$1.414213 - 1.414214 \approx 5.99 \cdot 10^{-7}$

28.25:

$x_0 = 2$

$x_1 = \frac{1}{2} \left(2 + \frac{3}{2}\right) = 1.75 = 1; 45$

$\frac{1}{1.75} \approx 0; 34, 17, 8$

Recall:

$x_{n+1} = \frac{1}{2} \left(x_n + \frac{3}{x_n}\right)$

The approximation we get is approximately $1; 37, 30 \approx 1.625$

28.28:

We have:

$$x^2 + y^2 = 1525$$

$$y = \frac{2}{3}x + 5$$

$$x^2 + \left(\frac{2}{3}x + 5\right)^2 = 1525$$

This works out to $x = 30, y = 25$.

28.30:

We have:

$$\frac{2}{3}A + \frac{1}{2}B = 1100$$

$$A - B = 600$$

This works out to $A = 1200$ sar, $B = 600$ sar.