

- (5) Gold bg. at $\frac{1}{2}$ per cent. disc., £100 is bought for £99 $\frac{1}{2}$;

$$\therefore £99\frac{1}{2} = \$484.565,$$

add 3.634 for freight,

\$488.20 cost of £100 in gold,

\$497.77 = cost of a bill of exch. for £100,

\$9.57 = difference on \$488.20;

$$\therefore \text{difference per cent.} = \frac{100}{488.20} \times 9.57 = 1.9, \text{ or } 2, \text{ nearly.}$$

$$\begin{aligned} (6) \quad & \frac{\sqrt{5} + \sqrt{3}}{2\sqrt{2}} - \frac{\sqrt{3}}{\sqrt{5} + \sqrt{3} + \sqrt{2}} = \frac{5-3 + \sqrt{2}(\sqrt{5} + \sqrt{3}) - 2\sqrt{2}\sqrt{3}}{2\sqrt{2}(\sqrt{5} - \sqrt{3} + \sqrt{2})} \\ & = \frac{\sqrt{2}\sqrt{5} - \sqrt{2}\sqrt{3} + 2}{2\sqrt{2}(\sqrt{5} - \sqrt{3} + \sqrt{2})} = \frac{\sqrt{2}(\sqrt{5} - \sqrt{3} + \sqrt{2})}{2\sqrt{2}(\sqrt{5} - \sqrt{3} + \sqrt{2})} = \frac{1}{2} \\ & (\sqrt{2 + \sqrt{2 + \sqrt{2}}})^3 - 3\sqrt{2 + \sqrt{2 + \sqrt{2}}} \\ & = \sqrt{2 + \sqrt{2 + \sqrt{2}}} \{ 2 + \sqrt{2 + \sqrt{2}} - 3 \} \\ & = \sqrt{2 + \sqrt{2 + \sqrt{2}}} \sqrt{3 + \sqrt{2} - 2\sqrt{2 + \sqrt{2}}} \\ & = \sqrt{6 + 2\sqrt{2} - 4\sqrt{2 + \sqrt{2}} + 3\sqrt{2 + \sqrt{2}} + \sqrt{2}} \\ & \quad [\sqrt{2 + \sqrt{2}} - 2(2 + \sqrt{2})] \\ & = \sqrt{2 - \sqrt{2} + \sqrt{2} + \sqrt{2}\sqrt{2 + \sqrt{2}}} \\ & = \sqrt{2 + \sqrt{2 + \sqrt{2}}(\sqrt{2} - 1)} \\ & = \sqrt{2 + \sqrt{2 + \sqrt{2}}\sqrt{3} - 2\sqrt{2}} \\ & = \sqrt{2 + \sqrt{2} - \sqrt{2}}. \end{aligned}$$

- (8) Discount on £567 for one year at given rate is £ $\frac{5103}{209}$.

$$\therefore \text{time required} = \frac{34\frac{1}{2}}{\frac{5103}{209}} \text{ years} = 1\frac{1}{2} \text{ years.}$$

$$(9) \quad £1 = \frac{40}{9} \times \frac{112\frac{1}{2}}{100} = \frac{40}{9} \times \frac{225}{100}$$

$$\therefore £18 \text{ } 19\text{s.} = \frac{40}{9} \times \frac{225}{200} \times 18 \frac{19}{20} = \frac{40}{9} \times \frac{225}{200} \times \frac{379}{20} = \frac{379}{4} = \$94.75.$$

$$(10) \quad .6\dot{7} = \frac{67}{99}, \quad .1\dot{4} = \frac{14}{90}.$$