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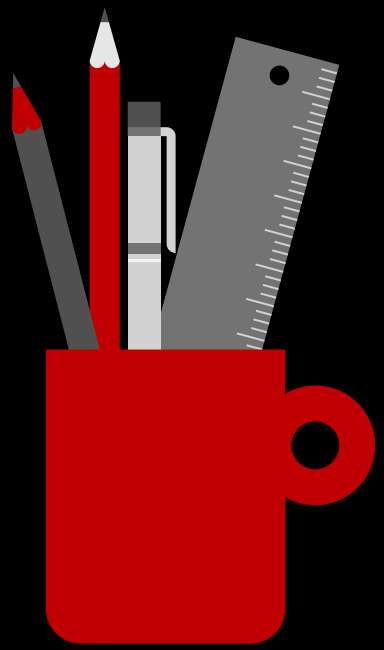

Effective Education Makes Gems out of stones

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Ex. 3.4

(i) 0.8176×13.64

Let $x = 0.8176 \times 13.64$

taking log of both sides

$\log x = \log 0.8176 \times 13.64$

$\log x = \log 0.8176 + \log 13.64$

$\log x = \bar{1}.9125 + 1.1348$

$= 0.9125 - 1 + 1.1348$

$\log x = 1.0473$

taking antilog of both sides

$x = \text{antilog } 1.0473$

ch. $= 1$, mintissa $= .0473$

$x = 1, 1.15$

$x = 11.15$ Ans

ii) $(789.5)^{1/8}$

Let $x = (789.5)^{1/8}$

$\log x = \log(789.5)^{1/8}$

$\log x = \frac{1}{8} \log 789.5$

$= \frac{1}{8}(2.897315)$

$\log x = \frac{1}{8}(2.8974)$

$\log x = 0.3622$

$x = \text{anti log } 0.3622$

Ch. $= 0$, Mantissa $= .3622$

$x = 2.302$

iii) $\frac{0.678 \times 9.01}{0.0234}$

Let $x = \frac{0.678 \times 9.01}{0.0234}$

$\log x = \log 0.678 + \log 9.01 - \log 0.0234$

$\log x = \bar{1}.8312 + 0.9547 - \bar{2}.3692$

$\log x = 0.8312 - 1 + 0.9547 - (0.3692 - 2)$

$\log x = 0.8312 - 1 + 0.9547 - 0.3692 + 2$

$\log x = 2.4167$

$x = \text{antilog } 2.4167$

Ch. = 2, Man. = .4167

$x = 2,61.0$

$x = 261.0$

iv) $\sqrt[5]{2.709} \times \sqrt[7]{1.239}$

let $x = (2.709)^{\frac{1}{5}} \times (1.239)^{1/7}$

$\log x = \log (2.709)^{\frac{1}{5}} \times (1.239)^{1/7}$

$\log x = \log (2.709)^{\frac{1}{5}} + \log (1.239)^{1/7}$

$\log x = \frac{1}{5} \log (2.709) + \frac{1}{7} \log (1.239)$

$\log x = \frac{1}{5} (0.4328) + \frac{1}{7} (0.0931)$

$= 0.0866 + 0.0133$

$\log x = 0.0999$

$x = \text{anti log } 0.0999$

ch = 0, min. = .0999

$x = 1.258$

$x = 1.259$

v) $\dfrac{(1.23)(0.6975)}{(0.0075)(1278)}$

let $x = \dfrac{(1.23)\times(0.6975)}{(0.0075)\times(1278)}$

$\log x = \log \dfrac{1.23 \times 0.6975}{0.0075 \times 1278}$

$\log x = \log 1.23 + \log 0.6975 - \log 0.0075 - \log 1278.$

$\log x = 0.0899 + \bar{1}.8435 - \bar{3}.8751 - 3.1065$

$\log x = 0.0899 + 0.8435 - 1 - (0.8751 - 3) - 3.1065$

$= 0.0899 + 0.8435 - 1 - 0.8751 + 3 - 3.1065$

$\log x = -1.0482$

$\log x = -1.0482 + 2 - 2$

$\log x = 0.9518 - 2$

$\log x = \bar{2}.9518$

$x = \text{antilog } \bar{2}.9518$

ch. $= \bar{2}$, Mintisse $= .9518$

$x = .08,9495$

$x = .0895$ Ans

vii) $\sqrt[3]{\dfrac{0.7214 \times 20.37}{60.8}}$

let $x = \left[\dfrac{0.7214 \times 20.37}{60.8}\right]^{1/3}$

$\log x = \log\left[\dfrac{0.7214 \times 20.37}{60.8}\right]^{1/3}$

$\log x = \frac{1}{3}\log \dfrac{0.7214 \times 20.37}{60.8}$

$\log x = \frac{1}{3}\left[\log 0.7214 + \log 20.37 - \log 60.8\right]$

$\log x = \frac{1}{3}\left[\bar{1}.8582 + 1.3090 - 1.7839\right]$

$\log x = \frac{1}{3}\left[0.8582 - 1 + 1.3090 - 1.7839\right]$

$\log x = \frac{1}{3}\left[-0.6167\right]$

$\log x = -0.2056$

$\log x = -0.2056 + 1 - 1$

$\log x = 0.7944 - 1$

$\log x = \bar{1}.7944$

$x = \text{antilog } \bar{1}.7944$

Ch. $= \bar{1}$, Mantissa $= .7944$

$x = 0.6229$

$x = 0.6229$ Ans.

viii) $\dfrac{83 \times \sqrt[3]{92}}{127 \times \sqrt[5]{246}}$

Let $x = \dfrac{83 \times (92)^{\frac{1}{3}}}{127 \times (246)^{\frac{1}{5}}}$

$\log x = \log \dfrac{83 \times (92)^{1/3}}{127 \times (246)^{1/5}}$

$\log x = \log 83 + \log (92)^{1/3} - \log 127 - \log (246)^{1/5}$

$\log x = \log 83 + \frac{1}{3} \log 92 - \log 127 - \frac{1}{5} \log 246$

$\log x = 1.9191 + \frac{1}{3}(1.9638) - 2.1038 - \frac{1}{5}(2.3909)$

$\log x = 1.9191 + 0.6546 - 2.1038 - 0.4782$

$\log x = \underline{-0.0083 + 1 - 1}$

$\log x = 0.9917 - 1$

$\log x = \bar{1}.9917$

$x = \text{anti.log } \bar{1}.9917$

Ch. $= \bar{1}$, Mantissa $= 0.9917$

$x = .9, 811$

$x = 0.9811$ Ans.

viii) $\dfrac{(438)^3 \times \sqrt{0.056}}{(388)^4}$

let $x = \dfrac{(438)^3 \times (0.056)^{1/2}}{(388)^4}$

$\log x = \log \dfrac{(438)^3 \times (0.056)^{1/2}}{(388)^4}$

$\log x = \log (438)^3 + \log (0.056)^{1/2} - \log (388)^4$

$\log x = 3 \log 438 + \frac{1}{2} \log 0.056 - 4 \log 388$

$= 3(2.6415) + \frac{1}{2}(\bar{2}.7482) - 4(2.5888)$

$\log x = 7.9245 + \frac{1}{2}(0.7482 - 2) - 10.3552$

$\log x = 7.9245 + \frac{1}{2}(-1.2518) - 10.3552$

$\log x = 7.9245 - 0.6259 - 10.3552$

$\log x = -3.0566 + 4 - 4$

$\log x = 0.9434 - 4$

$\log x = \bar{4}.9434$

$x = \text{anti log } \bar{4}.9434$

Ch $= \bar{4}$, Min. $= .9434$

$x = 8778$

$x = .00008778$ Ans =