

Question	Solution
1a	$\frac{2m^2 - 5m - 3}{2m^2 + m}$ $= \frac{(2m+1)(m-3)}{m(2m+1)}$ $= \frac{m-3}{m}$
b	$\frac{2p}{p^2-1} - \frac{5}{p-1} = 0$ $\frac{2p-5(p+1)}{p^2-1} = 0$ $p = -\frac{5}{3}$
c	$(x-2)(x-6) = 3$ $x^2 - 8x + 12 - 3 = 0$ $x = 1.35, 6.65$
2a	$\frac{9800 - 9506}{9800} \times 100 = 3\%$
bi	$\frac{20}{100} \times 9806 = \1961.20
bii	$\frac{(9800 - 1961.2) \times 5 \times 2.5}{100} = \979.85
biii	$\frac{979.85 + (9800 - 1961.2)}{30} = \293.96
c	<p>Amt after 1st yr = $0.9 \times 9800 = \\$8820$</p> <p>Amt after 2nd yr = $0.8 \times 8820 = \\$7056$</p> $\% \text{ lose} = \frac{9800 - 7056}{9800} \times 100 = 28\%$
3a	$P = 16, Q = 19$
b	$t = 3n + 1$
c	$61 = 3n + 1$ $n = 20$
d	$\text{Total triangles} = 3(1 + 2 + \dots + 100) + 100 = 15250$
4a	$\frac{1000}{x}$
b	$\frac{1000}{x+2}$

c	$\frac{1000}{x} - \frac{1000}{x+2} = 40$ $1000(x+2) - 1000x = 40x(x+2)$ $x^2 + 2x - 50 = 0$
d	$x = -8.14, 6.14$
e	$\frac{1000}{6.14} = 163s$
5a	Int Vol = $3.142 \times 24^2 \times 54 = 97730 \text{ cm}^3$
b	Vol = $3.142 \times 24.5^2 \times 55 - 97729 = 6000 \text{ cm}^3$
c	Wt = $6000 \times 6.8 = 40800 \text{ g} = 40.8 \text{ kg}$
d	Total Wt = $40800 + 3.5 \times 97729 = 382.9 \text{ kg}$
6a	$\angle BCE = \angle BAH$ (Angle in same segment) $\angle ABH = \angle HEC$ (Angle in same segment) $\angle AHB = \angle CHE$ (Opp Angle) $\triangle ABH \cong \triangle CEH$ (AAA)
bi	$\angle CEA = 68^\circ$ (Angle in same segment)
bii	$\angle ADC = 180^\circ - 68^\circ = 112^\circ$ (Cyclic Quad)
biii	$\angle AOC = 112^\circ \times 2 = 224^\circ$ (Angle at centre = twice angle at circumference)
biv	$\angle OCB = 68^\circ - 50^\circ = 18^\circ$ (Isos Triangle)
bv	$\angle ECG = 90^\circ - 68^\circ = 22^\circ$ (Tangent to centre of circle)
7a	$p = -3.5, q = -3.5$
c	2.1
d	-12
fi	2.4
fii	$3x + \frac{60}{x} - 35 = x - 5$ $2x^2 - 30x + 60 = 0$ $A = 2, B = -30$
8a	$\begin{pmatrix} -1 & 4 \\ \frac{1}{2} & 7 \end{pmatrix} + 2 \begin{pmatrix} 5 & 0 \\ -1 & 6 \end{pmatrix} = \begin{pmatrix} 9 & 4 \\ -\frac{3}{2} & 19 \end{pmatrix}$
bi	$\begin{pmatrix} 1 & 4 & 0 \\ 2 & 1 & 3 \end{pmatrix} \begin{pmatrix} 45 \\ 20 \\ 40 \end{pmatrix} = \begin{pmatrix} 125 \\ 230 \end{pmatrix}$ <p>125 represents total number of fruits for Juice A and 230 represents total number of fruits for Juice B.</p>
bii	$Q = \begin{pmatrix} 10 & 18 \end{pmatrix} \begin{pmatrix} 1 & 4 & 0 \\ 2 & 1 & 3 \end{pmatrix} = \begin{pmatrix} 46 & 58 & 54 \end{pmatrix}$
biii	Total cost of each fruit in both Juice A and B.
9ai	500 kg

9aii(a)	410 kg
9aii(b)	$520 - 300 = 220$
9aii(c)	270 kg
9aiii	20, 36, 20, 4
9bi	$\frac{3}{8} \times \frac{5}{7} + \frac{5}{8} \times \frac{3}{7} = \frac{15}{28}$
9bii	$\frac{2}{8} \times \frac{2}{7} + \frac{2}{8} \times \frac{2}{7} + \frac{1}{8} \times \frac{2}{7} + \frac{2}{8} \times \frac{1}{7} = \frac{3}{14}$
10ai	$OB = OD$ (radius) $DO = DB$ (radius) $\therefore OBD$ is an equilateral triangle
aii	$\angle ABD = \angle CBO = 90^\circ$ (Angle in semi-circle) $OC = AD$ (Diameter of circle since radius is equal) $BD = OD$ (Equilateral Triangle) $\therefore \triangle ABD \equiv \triangle CBO$ (RHS)
10bi	$\angle AOT = \angle BOT = \cos^{-1} \frac{18}{28} = 50^\circ$ $\angle AOB = 100^\circ$
bii	$\text{Length} = \frac{100}{360} \times 2 \times 3.142 \times 28 = 48.88 \approx 48.9 \text{ cm}$
bihi	$\text{Area} = 3.142 \times 28^2 - \left(\frac{100}{360} \times 3.142 \times 28^2 (100 - \sin 100) \right) = 1850 \text{ cm}^2$
biv	$\frac{1850}{3.142 \times 28^2} \times 100 = 75.1\%$