Answers

1. Sets

Practice set 1.1

(1) (i) {2, 4, 6, 8, ...} (ii) {2} (iii) {–1, –2, –3, ...} (iv) {sa, re, ga, ma, pa, dha, ni}

(2) (i) $\frac{4}{3}$ is an element of set Q. (ii) –2 is not an element of set N

(iii) Set P is a set of all p's such that p is an odd number.

(4) (i) A = {Chaitra, Vaishakh, Jyeshth, Ashadh, Shravan, Bhadra, Ashwin, Kartik, Agrahayan, Paush, Magh, Phalgun}

(ii) X = {C, O, M, P, L, E, N, T} (iii) Y = {Nose, Ears, Eyes, Tounge, Skin}

(iv) Z = {2, 3, 5, 7, 11, 13, 17, 19}

(v) E = {Asia, Africa, Europe, Australia, Antarctica, South America, North America}

(5) (i) $A = \{x \mid x = n^2, n \in N, n \leq 10\}$ (ii) $B = \{x \mid x = 6n, n \in N, n < 9\}$

(iii) C = {y | y is a letter in the word 'SMILE'}

(iv) D = {z | z is a day of a week} (v) X = {y | y is a letter in the word 'eat'}

Practice set 1.2

(1) A = B = C (2) A = B (3) A and C are empty sets.

(4) (i), (iii), (iv), (v) are finite sets (ii), (vi), (vii) are infinte sets

Practice set 1.3

(1) (i), (ii), (iii), (v) are false and (iv), (vi) are true statements.

(4) {1}, {3}, {2}, {7}, {1, 3}, {1, 2}, {1, 7}, {3, 2}, {3, 7}, {2, 7}, {1, 3, 2}, {1, 2, 7}, {3, 2, 7}, {1, 3, 2, 7} any three like these sets..

(5) (i) $P \subseteq H$, $P \subseteq B$, $I \subseteq M$, $I \subseteq B$, $H \subseteq B$, $M \subseteq B$ (ii) set B

(6) (i) N, W, I any of these sets. (ii) N, W, I any of these sets.

(7) Set of students getting marks less than 50% in Maths.

Practice set 1.4

(1) n (B) = 21 (2) Number of students who do not take any of the drinks = 5

(3) Total number of students = 70

(4) The number of students who do not like rock climbing and sky-watching = 20

The students who like only rock climbing = 20,

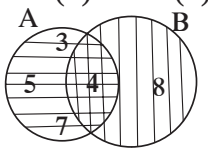
The students who like only sky watching = 70

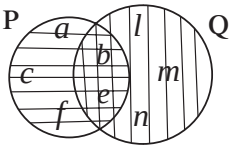
(5) (i) $A = \{x, y, z, m, n\}$ (ii) $B = \{p, q, r, m, n\}$

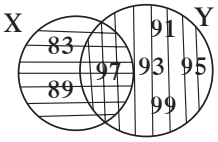
(iii) $A \cup B = \{x, y, z, m, n, p, q, r\}$ (iv) $U = \{x, y, z, m, n, p, q, r, s, t\}$

(v) $A' = \{p, q, r, s, t\}$ (vi) $B' = \{x, y, z, s, t\}$ (vii) $(A \cup B)' = \{s, t\}$

Problem set 1

(1) (i) (C) (ii) (D) (iii) (C) (iv) (B) (v) (A) (vi) (A)
(2) (i) (A) (ii) (A) (iii) (B) (iv) (C)
(3) People speaking only English 57, People speaking only french 28, People speaking both languages 15
(4) 135 (5) 12 (6) 4
(7) (i) 

(ii) 

(iii) 

(8) $S \subseteq X$, $V \subseteq X$, $S \subseteq X$, $T \subseteq X$, $S \subseteq Y$, $S \subseteq V$, $S \subseteq T$, $V \subseteq T$, $Y \subseteq T$,
(9) $M \cup \phi = M$, $M \cap \phi = \phi$
(10) $U = \{1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13\}$, $A = \{1, 2, 3, 5, 7\}$ $B = \{1, 5, 8, 9, 10\}$
$M \cup B = \{1, 2, 3, 5, 7, 8, 9, 10\}$, $A \cap B = \{1, 5\}$
(11) $n(A \cup B) = 16$

2. Real Numbers

Practice set 2.1

(1) Terminating (i), (iii), (iv) Non recurring non terminating (ii), (v)
(2) (i) 0.635 (ii) $0.\overline{25}$ (iii) $3.\overline{285714}$ (iv) 0.8 (v) 2.125
(3) (i) $\frac{2}{3}$ (ii) $\frac{37}{99}$ (iii) $\frac{314}{99}$ (iv) $\frac{1574}{99}$ (v) $\frac{2512}{999}$

Practice set 2.2

(4) (i) Infinitely many numbers like –0.4, –0.3, 0.2
(ii) Infinitely many numbers like –2.310, –2.320, –2.325
(iii) Infinitely many numbers like 5.21, 5.22, 5.23
(iv) Infinitely many numbers like –4.51, –4.55, –4.58

Practice set 2.3

(1) (i) 3 (ii) 2 (iii) 4 (iv) 2 (v) 3
(2) (i), (iii), (vi) are surds and (ii), (iv), (v) are not surds.
(3) Like surds : (i), (iii), (iv) and unlike surds : (ii), (v), (vi)
(4) (i) $3\sqrt{3}$ (ii) $5\sqrt{2}$ (iii) $5\sqrt{10}$ (iv) $4\sqrt{7}$ (v) $2\sqrt{42}$
(5) (i) $7\sqrt{2} > 5\sqrt{3}$ (ii) $\sqrt{247} < \sqrt{274}$ (iii) $2\sqrt{7} = \sqrt{28}$
(iv) $5\sqrt{5} < 7\sqrt{5}$ (v) $4\sqrt{42} > 9\sqrt{2}$ (vi) $5\sqrt{3} < 9$ (vii) $7 > 2\sqrt{5}$
(6) (i) $13\sqrt{5}$ (ii) $10\sqrt{5}$ (iii) $24\sqrt{3}$ (iv) $\frac{12}{5}\sqrt{7}$

(7) (i) $18\sqrt{6}$ (ii) $126\sqrt{5}$ (iii) $6\sqrt{10}$ (iv) 80

(8) (i) 7 (ii) $\sqrt{\frac{5}{2}}$ (iii) $\sqrt{2}$ (iv) $\sqrt{62}$.

(9) (i) $\frac{3}{5}\sqrt{5}$ (ii) $\frac{\sqrt{14}}{14}$ (iii) $\frac{5\sqrt{7}}{7}$ (iv) $\frac{2}{9}\sqrt{3}$ (v) $\frac{11}{3}\sqrt{3}$

Practice set 2.4

(1) (i) $-3+\sqrt{21}$ (ii) $\sqrt{10}-\sqrt{14}$ (iii) $-18+13\sqrt{6}$

(2) (i) $\frac{\sqrt{7}-\sqrt{2}}{5}$ (ii) $\frac{3\left(2\sqrt{5}+3\sqrt{2}\right)}{2}$ (iii) $28-16\sqrt{3}$ (iv) $4-\sqrt{15}$

Practice set 2.5

(1) (i) 13 (ii) 5 (iii) 28 (2) 2 or $\frac{4}{3}$ (ii) 1 or 6 (iii) –2 or 18 (iv) 0 or –40

Problem set 2

(1) (i) B (ii) D (iii) C (iv) D (v) A

(vi) C (vii) C (viii) C (ix) A (x) B

(2) (i) $\frac{555}{1000}$ (ii) $\frac{29539}{999}$ (iii) $\frac{9306}{999}$ (iv) $\frac{357060}{999}$ (v) $\frac{30189}{999}$

(3) (i) $-0.\overline{714285}$ (ii) $0.\overline{81}$ (iii) 2.2360679... (iv) $9.\overline{307692}$ (v) 3.625

(5) (i) $\frac{3}{2}\sqrt{2}$ (ii) $-\frac{5}{3}\sqrt{5}$

(6) (i) $\sqrt{2}$ (ii) $\sqrt{2}$ (iii) $\sqrt{3}$ (iv) $\sqrt{10}$ (v) $\sqrt{2}$ (vi) $\sqrt{11}$

(7) (i) $6\sqrt{3}$ (ii) $\frac{34}{3}\sqrt{3}$ (iii) $\frac{15}{2}\sqrt{6}$ (iv) $-25\sqrt{3}$ (v) $\frac{8}{3}\sqrt{3}$

(8) (i) $\frac{\sqrt{5}}{5}$ (ii) $\frac{2\sqrt{7}}{21}$ (iii) $\sqrt{3}+\sqrt{2}$ (iv) $\frac{3\sqrt{5}-2\sqrt{2}}{37}$ (v) $\frac{6\left(4\sqrt{3}+\sqrt{2}\right)}{23}$

3. Polynomials

Practice set 3.1

(1) (i) No, because index of y in $\frac{1}{y}$ is (-1) .

(ii) No, because index of x in the term $5\sqrt{x}$ is $\left(\frac{1}{2}\right)$.

(iii) Yes. (iv) No, because index of m in the term $2m^{-2}$ is (-2) . (v) Yes.

(2) (i) 1 (ii) $-\sqrt{3}$, (iii) $-\frac{2}{3}$

(3) (i) x^7 (ii) $2x^{35}-7$ (iii) x^8-2x^5+3 other polynomials like these.

(4) (i) 0 (ii) 0 (iii) 2 (iv) 10 (v) 1 (vi) 5 (vii) 3 (viii) 10

(5) (i) Quadratic (ii) Linear (iii) Linear (iv) Cubic (v) Quadratic (vi) Cubic

(6) (i) $m^3 + 5m + 3$ (ii) $y^5 + 2y^4 + 3y^3 - y^2 - 7y - \frac{1}{2}$

(7) (i) (1, 0, 0, –2) (ii) (5, 0) (iii) (2, 0, –3, 0, 7) (iv) $\left(\frac{-2}{3}\right)$

(8) (i) $x^2 + 2x + 3$ (ii) $5x^4 - 1$ (iii) $-2x^3 + 2x^2 - 2x + 2$

(9) Quadratic polynomial : x^2; $2x^2 + 5x + 10$; $3x^2 + 5x$;

Cubic polynomial : $x^3 + x^2 + x + 5$; $x^3 + 9$ Linear polynomial : $x + 7$;

Binomial : $x + 7$, $x^3 + 9$; Trinomial : $2x^2 + 5x + 10$; Monomial : x^2

Practice set 3.2

(1) (i) $a + bx$ (ii) xy (iii) $10n + m$

(2) (i) $6x^3 - 2x^2 + 2x$ (ii) $-2m^4 + 2m^3 + 2m^2 + 3m - 6 + \sqrt{2}$ (iii) $5y^2 + 6y + 11$

(3) (i) $-6x^2 + 10x$ (ii) $10ab^2 + a^2b - 7ab$

(4) (i) $2x^3 - 4x^2 - 2x$ (ii) $x^8 + 2x^7 + 2x^5 - x^3 - 2x^2 - 2$ (iii) $-4y^4 + 7y^2 + 3y$

(5) (i) $x^3 - 64 = (x - 4)(x^2 + 4x + 16) + 0$

(ii) $5x^5 + 4x^4 - 3x^3 + 2x^2 + 2 = (x^2 - x)(5x^3 + 9x^2 + 6x + 8) + (8x + 2)$

(6) $a^4 + 7a^2b^2 + 2b^4$

Practice set 3.3

(1) (i) Quotient = $2m + 7$, Remainder = 45

(ii) Quotient = $x^3 + 3x - 2$, Remainder = 9

(iii) Quotient = $y^2 + 6y + 36$, Remainder = 0

(iv) Quotient = $2x^3 - 3x^2 + 7x - 17$, Remainder = 51

(v) Quotient = $x^3 - 4x^2 + 13x - 52$, Remainder = 200

(vi) Quotient = $y^2 - 2y + 3$, Remainder = 2

Practice set 3.4

(1) 5 (2) 1 (3) $4a^2 + 20$ (4) –11

Practice set 3.5

(1) (i) –41 (ii) 7 (iii) 7 (2) (i) 1, 0, –8 (ii) 4, 5, 13 (iii) –2, 0, 10

(3) 0 (4) 2 (5) (i) 17 (ii) $2a^3 - a^2 - a$ (iii) 1544 (6) 92 (7) Yes

(8) 2 (9) (i) No (ii) Yes (10) 30 (11) Yes

(13) (i) –3 (ii) 80

Practice set 3.6

(1) (i) $(x + 1)(2x - 1)$ (ii) $(m + 3)(2m - 1)$ (iii) $(3x + 7)(4x + 11)$

(iv) $(y - 1)(3y + 1)$ (v) $(x + \sqrt{3})(\sqrt{3}x + 1)$ (vi) $(x - 4)\left(\frac{1}{2}x - 1\right)$

(2) (i) $(x - 3)(x + 2)(x - 2)(x + 1)$ (ii) $(x - 13)(x - 2)$

(iii) $(x-8)(x+2)(x-4)(x-2)$ (iv) $(x^2-2x+10)(x^2-2x-2)$

(v) $(y^2+5y-22)(y+4)(y+1)$ (vi) $(y+6)(y-1)(y+4)(y+1)$

(vii) $(x^2-8x+18)(x^2-8x+13)$

Problem set 3

(1) (i) D (ii) D (iii) C (iv) A (v) C (vi) A (vii) D (viii) C (ix) A (x) A

(2) (i) 4 (ii) 0 (iii) 9

(3) (i) $7x^4-x^3+4x^2-x+9$ (ii) $5p^4+2p^3+10p^2+p-8$

(4) (i) (1, 0, 0, 0, 16) (ii) (1, 0, 0, 2, 3, 15)

(5) (i) $3x^4-2x^3+0x^2+7x+18$ (ii) $6x^3+x^2+0x+7$ (iii) $4x^3+5x^2-3x+0$

(6) (i) $10x^4+13x^3+9x^2-7x+12$ (ii) $p^3q+4p^2q+4pq+7$

(7) (i) $2x^2-7y+16$ (ii) x^2+5x+2

(8) (i) $m^7-4m^5+6m^4+6m^3-12m^2+5m+6$

(ii) $5m^5-5m^4+15m^3-2m^2+2m-6$

(9) Remainder = 19 (10) $m=1$ (11) Total population $=10x^2+5y^2-xy$

(12) $b=\frac{1}{2}$ (13) $11m^2-8m+5$ (14) $-2x^2+8x+11$ (15) $2m+n+7$

4. Ratio and Proportion

Practice set 4.1

(1) (i) 6 : 5 (ii) 2 : 3 (iii) 2 : 3

(2) (i) 25 : 11 (ii) 35 : 31 (iii) 2 : 1 (iv) 10 : 17 (v) 2 : 1 (vi) 220 : 153

(3) (i) 3 : 4 (ii) 11 : 25 (iii) 1 : 16 (iv) 13 : 25 (v) 4 : 625

(4) 4 people (5) (i) 60% (ii) 94% (iii) 70% (iv) 91% (v) 43.75%

(6) Abha's age 18 years, Mother's age 45 years (7) After 6 years

(8) Present age of Rehana is 8 years.

Practice set 4.2

(1) (i) 20, 49, 2.5 respectively (ii) 7, 27, 2.25 respectively

(2) (i) $1:2\pi$ (ii) $2:r$ (iii) $\sqrt{2}:1$ (iv) 34 : 35

(3) (i) $\frac{\sqrt{5}}{3}<\frac{3}{\sqrt{7}}$ (ii) $\frac{3\sqrt{5}}{5\sqrt{7}}=\frac{\sqrt{63}}{\sqrt{125}}$ (iii) $\frac{5}{18}>\frac{17}{121}$

(iv) $\frac{\sqrt{80}}{\sqrt{48}}=\frac{\sqrt{45}}{\sqrt{27}}$ (v) $\frac{9.2}{5.1}>\frac{3.4}{7.1}$

(4) (i) 80^{o} (ii) Present age of Albert is 25 years, Present age of Salim is 45 years

(iii) Length 13.5 cm, Breadth 4.5 cm (iv) 124, 92 (v) 20, 18

(5) (i) 729 (ii) 45 : 7 (6) 2 : 125 (7) $x = 5$

Practice set 4.3

(1) (i) 22 : 13 (ii) 125 : 71 (iii) 316 : 27 (iv) 38 : 11

(2) (i) 3 : 5 (ii) 1 : 6 (iii) 7 : 43 (iv) 71 : 179 (3) 170 : 173

(4) (i) $x = 8$ (ii) $x = 9$ (iii) $x = 2$ (iv) $x = 6$ (v) $x = \frac{9}{14}$ (vi) $x = 3$

Practice set 4.4

(1) (i) 36, 22 (ii) 16, $2a - 2b + 2c$

(2) (i) 29 : 21 (ii) 23 : 7 (4) (i) $x = 2$ (ii) $y = 1$

Practice set 4.5

(1) $x = 4$ (2) $x = \frac{347}{14}$ (3) 18, 12, 8 or 8, 12, 18 (6) $\frac{x + y}{xy}$

Problem set 4

(1) (i) B (ii) C (iii) B (iv) D (v) C

(2) (i) 7 : 16 (ii) 2 : 5 (iii) 5 : 9 (iv) 6 : 7 (v) 6 : 7

(3) (i) 1 : 2 (ii) 5 : 4 (iii) 1 : 1

(4) (i) and (iii) are in continued proportion. (ii) and (iv) are not in continued proportion.

(5) $b = 9$

(6) (i) 7.4% (ii) 62.5% (iii) 73.33% (iv) 31.25% (v) 12%

(7) (i) 5 : 6 (ii) 85 : 128 (iii) 1 : 2 (iv) 50 : 1 (v) 3 : 5

(8) (i) $\frac{17}{9}$ (ii) 19 (iii) $\frac{35}{27}$ (iv) $\frac{13}{29}$

(11) $x = 9$

5. Linear Equations in Two Variables

Practice set 5.1

(3) (i) $x = 3;\ y = 1$ (ii) $x = 2;\ y = 1$ (iii) $x = 2;\ y = -2$

(iv) $x = 6;\ y = 3$ (v) $x = 1;\ y = -2$ (vi) $x = 7;\ y = 1$

Practice set 5.2

(1) 30 notes of ₹ 5 and 20 notes of ₹ 10.

(2) $\frac{5}{9}$ (3) Priyanka's age is 20 years, Deepika's age is 14 years

(4) 20 lions, 30 peacocks

(5) Initial salary ₹ 3900, Yearly increment ₹ 150

(6) ₹ 4000 (7) 36 (8) $\angle A = 90^0$, $\angle B = 40^0$, $\angle C = 50^0$

(9) 420 cm (10) 10

Problem set 5

(1) (i) A (ii) C (iii) C

(2) (i) $x = 2;\ y = 1$ (ii) $x = 5;\ y = 3$ (iii) $x = 8;\ y = 3$

(iv) $x = 1;\ y = -4$ (v) $x = 3;\ y = 1$ (vi) $x = 4;\ y = 3$

(3) (i) $x = 1;\ y = -1$ (ii) $x = 2;\ y = 1$ (iii) $x = 26;\ y = 18$ (iv) $x = 8;\ y = 2$

(4) (i) $x = 6;\ y = 8$ (ii) $x = 9;\ y = 2$ (iii) $x = \frac{1}{2};\ y = \frac{1}{3}$ (5) 35

(6) ₹ 69 (7) ₹ 1800 and ₹ 1400 is the monthly income of each person respectively.

(8) length 347 units, breadth 207 units (9) 40 km/hr, 30 km/hr

(10) (i) 54, 45 (ii) 36, 63 etc.

6. Financial Planning

Practice set 6.1

(1) ₹ 1200 (2) Capital after second years ₹ 42,000, 16% loss on initial capital.

(3) Monthly income ₹ 50,000 (4) Shri. Fernandes (5) ₹ 25,000

Practice set 6.2

(1) (i) Need not pay income tax (ii) Needs to pay (iii) Needs to pay

(iv) Needs to pay (v) Need not pay income tax

(2) ₹ 9836.50

Problem set 6

(1) (i) A (ii) B (2) Income ₹ 8750

(3) 36.73% profit of Hiralal, 16.64% profit of Ramniklal. Hiralal's profit is more.

(4) ₹ 99383.75 (5) ₹ 4,00,000 (6) 12.5%

(7) Savings of Ramesh is ₹ 48000 ; Savings of Suresh is ₹ 51000 ; Savings of Priti is ₹ 36000

(8) (i) ₹ 213000 (ii) ₹ 7500 (iii) No tax.

7. Statistics

Practice set 7.2

(1) Primary data : (i), (iii), (v) Secondary data : (ii), (iv)

Practice set 7.3

(1) Lower limit of class = 20, Upper limit of class = 25 (2) 37.5 (3) 7–13

Practice set 7.4

(3) (i) 38 (ii) 3 (iii) 19 (iv) 62 (4) (i) 24 (ii) 3 (iii) 43 (iv) 43

Practice set 7.5

(1) 7 quintal (2) 74 (3) 100 (4) ₹ 4900 (5) 75 gram

(6) Mean = 3, Median = 3, Mode = 4 (7) 78.56 (8) $x = 9$ (9) 20 (10) 70

(11) 34.25 (12) 37 kg (13) 2 (14) 35 and 37

Problem set 7

(1) (i) C (ii) B (iii) D (iv) B (v) A (vi) D
(vii) B (viii) A (ix) C (x) C

(2) ₹ 26000 (3) ₹ 127

(4) (i) 24 (ii) 06

(5) $p = 20$

(6) (i) 66 (ii) 14 (iii) 45

(7) (i) 11 (ii) 68

(8) $x = 52$, Mean = 55.9, Mode = 52