

Answers & Explanatory notes

CONTENTS

Unit 1	Directed Numbers	p. A1
Unit 2	Basic Algebra	p. A2
Unit 3	Patterns and Sequences	p. A3
Unit 4	Linear Equations in One Unknown	p. A4
Unit 5	Percentages (1)	p. A6
Unit 6	Laws of Indices (1)	p. A8
Unit 7	Operations of Simple Polynomials	p. A9
Unit 8	Estimation in Numbers and Measurement	p. A10
Unit 9	Basic Geometry	p. A11
Unit 10	Symmetry and Transformation	p. A12
Unit 11	Congruence and Similarity	p. A12
Unit 12	Area and Volume (1)	p. A14
Unit 13	Introduction to Coordinates	p. A15
Unit 14	Graphs of Linear Equations in Two Unknowns	p. A17
Unit 15	Simple Statistical Graphs (1)	p. A19

Answers & Explanatory notes

UNIT 1 DIRECTED NUMBERS

1. B	2. D	3. A	4. A	5. D	6. D	7. C	8. C
9. C	10. C	11. C	12. D	13. C	14. B	15. C	16. C
17. A	18. C	19. A	20. A	21. D	22. B	23. B	24. C
25. B	26. D	27. B	28. C	29. B	30. A	31. B	32. D
33. D	34. A	35. D	36. C	37. C	38. B	39. D	40. D
41. B	42. D	43. A	44. D	45. A	46. B	47. A	48. B
49. B	50. A	51. B	52. C	53. C	54. A	55. C	56. A
57. B	58. B	59. A	60. A	61. C	62. C	63. C	

Explanatory Notes

4. integers: 整數

5. “0” is neither positive nor negative.

21. $= -3 \div 0 = \text{meaningless}$

22. $= (-30) \times (0) = 0$

23. $= \frac{(+42)}{(+7)(-3)} = -2$

34. $= 14 \times (+3) + (18 - 14) \times (-2) + (20 - 18) \times (-1) = 42 - 8 - 2 = 32$

35. $= 6000 - 6 \times (-400) = 6000 + 2400 = 8400$

45. $= 1 \div [(-1) - (-\frac{2}{3})] = 1 \div (-1 + \frac{2}{3}) = 1 \div (-\frac{1}{3}) = -3$

46. $= (-1) \times (+1) = -1$ $[-1^{10} = -(1^{10}) = -1]$

48. $= -16 + (+16) = 0$ $[-4^2 = -(4^2) = -16]$

53. $-x > 0$ is true, $\therefore -1 \times (\text{negative no.}) = \text{positive no.}$

$-x < x$ is false, $\therefore \text{positive no. is greater than negative no.}$

$\frac{1}{x} < 0$ is true, $\therefore 1 \div (\text{negative no.}) = \text{negative no.}$

55. $x + y > 0$ is true, \therefore the sum of 2 negative nos. is negative.

$x < y$, $\therefore x - x < y - x$, $0 < y - x$, $y - x > 0$

56. $= (1 - 2) + (3 - 4) + \dots + (99 - 100) = (-1) + (-1) + \dots + (-1)$
 $= (-1) \times 50 = -50$

60. $-6 + x > 0$, $\therefore x > 6$, i.e. x is a positive number greater than 6.

62. $= -5 + (6900 - 4400) \div 500 \times (-3) = -5 + (-15) = -20$

63. $= [4 \times (-60000) + (12 - 4) \times (+25000)] \div 4 = -40000 \div 4$
 $= -10000$

UNIT 2 BASIC ALGEBRA

1. A 2. B 3. B 4. D 5. C 6. A 7. D 8. D
 9. A 10. C 11. D 12. B 13. A 14. C 15. A 16. B
 17. A 18. B 19. C 20. D 21. A 22. A 23. D 24. B
 25. D 26. C 27. B 28. D 29. A 30. C 31. A 32. B
 33. D 34. C 35. B 36. C 37. B 38. C 39. D 40. B
 41. C 42. B 43. A 44. D 45. A

Explanatory Notes

5. $A, B, D: y - 6$; $C: 6 - y$
 6. The sum of the squares of a and $b = a^2 + b^2$;
 the square of the sum of a and $b = (a + b)^2$;
 \therefore the answer = $\frac{a^2 + b^2}{(a + b)^2}$
 13. $= 25a + 5a - 1 \times 5 = 30a - 5$
 15. $= 6 + 3y + 3y = 6 + 6y$
 16. $= k^2 + k + k^2 - 2k = 2k^2 - k$
 20. product: 積
 21. quotient: 商
 25. $= 1 \div \frac{2}{3} - \frac{1}{(-6)} = \frac{3}{2} + \frac{1}{6} = \frac{10}{6} = \frac{5}{3} = 1\frac{2}{3}$
 26. A: $2(-2)^3 = 2(-8) = -16$
 B: $-(-2)^4 = -(16) = -16$
 C: $4(-2)^2 = 4(4) = 16$
 D: $8(-2) = -16$
 28. $= 3^2 - (-2)^3 = 9 - (-8) = 9 + 8 = 17$
 32. consecutive odd nos.: 連續單數
 33. consecutive multiples: 連續倍數
 36. $2008 - 1999 = 9$; $(n - 7) + 9 = n + 2$
 38. Distance = speed \times time ; the actual speed = $(s - w)$ km/h ,
 \therefore the distance = $(s - w)t$ km
 42. $y \div 3x = \frac{y}{3x}$; $y \div 3 \div x = y \times \frac{1}{3} \times \frac{1}{x} = \frac{y}{3x}$;
 $y \div 3 \times x = y \times \frac{1}{3} \times x = \frac{xy}{3}$
 45. The total distance they travelled in 1 second = $(h + k)$ m;
 they have to travel d m so as to meet each other,
 \therefore the time taken = $\frac{d}{h + k}$ seconds

UNIT 3 PATTERNS AND SEQUENCES

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. B | 2. C | 3. A | 4. B | 5. D | 6. A | 7. D | 8. D |
| 9. C | 10. D | 11. A | 12. B | 13. D | 14. B | 15. D | 16. B |
| 17. C | 18. B | 19. D | 20. C | 21. C | 22. A | 23. B | 24. A |
| 25. D | 26. A | 27. C | 28. C | 29. B | 30. C | 31. B | 32. A |
| 33. C | 34. B | 35. B | 36. C | 37. C | 38. A | 39. B | 40. D |

Explanatory Notes

- Common difference = -7 ,
 \therefore the sequence is $16, 9, 2, -5, -12, -19, \dots$
- Common ratio = $\frac{2}{3}$,
 \therefore the sequence is $9, 6, 4, \frac{8}{3}, \frac{16}{9}, \frac{32}{27}, \frac{64}{81}, \dots$
- $a_1 = 4, a_2 = 8, a_3 = 12$, common difference = 4 , $\therefore a_4 = 16, a_5 = 20$
- $a_1 = 4 = 2^2, a_2 = 9 = 3^2, a_3 = 16 = 4^2$, $\therefore a_n = (n+1)^2$
 $\therefore a_6 = (6+1)^2 = 49$
- $a_1 = 4, a_2 = 10, a_3 = 16$, common difference = 6 , $\therefore a_4 = 22, a_5 = 28$
- $-4 + 1 = -3, -3 + 3 = 0, 0 + 5 = 5, 5 + 7 = 12, 12 + 9 = 21$
- $2 \times 1 = 2, 2 \times 3 = 6, 6 \times 5 = 30, 30 \times 7 = 210, 210 \times 9 = 1890$
- $48 \div 2 = 24, 24 \div 3 = 8, 8 \div 4 = 2, 2 \div 5 = \frac{2}{5}$
- $\frac{7-1}{2+1} = \frac{6}{3} = 2, \frac{6-1}{3+1} = \frac{5}{4}, \frac{5-1}{4+1} = \frac{4}{5}, \frac{4-1}{5+1} = \frac{3}{6} = \frac{1}{2}, \frac{3-1}{6+1} = \frac{2}{7}$
- $3 + 2 = 5, 5 + 4 = 9, 9 + 8 = 17, 17 + 16 = 33, 33 + 32 = 65$
- $-6 \times (-2) + 1 = 13, 13 \times (-2) + 1 = -25, -25 \times (-2) + 1 = 51,$
 $51 \times (-2) + 1 = -101$
- $0^2 + 1 = 1, 1^2 + 1 = 2, 2^2 + 1 = 5, 5^2 + 1 = 26, 26^2 + 1 = 677$
- $a_n = 2n(n-1)(n+1)$ which must be even (雙數),
 $\therefore 135$ is impossible.
- $a_n = 2^n + 1$ which must be odd (單數), $\therefore 324$ is impossible.
- $a_1 = 3, a_2 = 7 = 3 + 4 \times 1, a_3 = 11 = 3 + 4 \times 2, a_4 = 15 = 3 + 4 \times 3,$
 $\therefore a_n = 3 + 4 \times (n-1) = 4n - 1$
- $a_1 = 2 = 3 - 1, a_2 = 8 = 3^2 - 1, a_3 = 26 = 3^3 - 1, a_4 = 80 = 3^4 - 1,$
 $\therefore a_n = 3^n - 1$
- Triangular numbers are: $1, 3, 6, 10, 15, 21, 28, 36, 45, 55, \dots$
- Fibonacci numbers are: $1, 1, 2, 3, 5, 8, 13, 21, 34, \dots$

32. Common difference = $x + 1$, \therefore the sequence is $x - 3, 2x - 2, 3x - 1, 4x, 5x + 1, 6x + 2, 7x + 3, \dots$
37. For $a_n = n^2$, $a_2 - a_1 = 2^2 - 1^2 = 3$, $a_3 - a_2 = 3^2 - 2^2 = 5 \neq a_2 - a_1$,
 \therefore it is not an arithmetic sequence.
38. For $a_n = n^3$, $\frac{a_2}{a_1} = \frac{2^3}{1^3} = 8$, $\frac{a_3}{a_2} = \frac{3^3}{2^3} = \frac{27}{8} \neq \frac{a_2}{a_1}$,
 \therefore it is not a geometric sequence.

UNIT 4 LINEAR EQUATIONS IN ONE UNKNOWN

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. A | 2. C | 3. C | 4. B | 5. A | 6. B | 7. A | 8. C |
| 9. D | 10. A | 11. B | 12. A | 13. D | 14. D | 15. A | 16. B |
| 17. C | 18. B | 19. A | 20. D | 21. A | 22. B | 23. C | 24. D |
| 25. D | 26. C | 27. D | 28. B | 29. B | 30. A | 31. B | 32. D |
| 33. D | 34. A | 35. D | 36. C | 37. C | 38. D | 39. C | 40. C |
| 41. A | 42. B | 43. D | 44. B | 45. D | 46. A | 47. C | 48. D |
| 49. C | 50. B | 51. D | 52. B | 53. A | 54. D | 55. D | 56. C |
| 57. B | 58. D | 59. B | 60. A | 61. B | 62. B | 63. B | 64. D |
| 65. C | | | | | | | |

Explanatory Notes

27. $9 - y = 21 + 7y - (12y + 4)$, $9 - y = 21 + 7y - 12y - 4$,
 $-y - 7y + 12y = 21 - 4 - 9$, $4y = 8$, $\therefore y = 2$
38. The larger number = x , the smaller number = $84 - x$,
 $\therefore x = 3(84 - x) + 4$, $4x = 256$, $x = 64$
39. Upper base = x cm, lower base = $3x$ cm, $\therefore \frac{(3x + x) \times 12}{2} = 60$,
 $4x = 10$, $x = 2.5$, \therefore lower base = $3(2.5) = 7.5$ cm
40. No. of \$2 coins = x , no. of \$5 coins = $50 - x$,
 $\therefore 2x + 5(50 - x) = 169$, $-3x = -81$, $x = 27$
41. No. of 1.5 kg packs = x , no. of 0.5 kg packs = $96 - x$,
 $\therefore 1.5x + 0.5(96 - x) = 78$, $1.5x + 48 - 0.5x = 78$, $x = 30$
42. Smaller group = x , larger group = $108 - x$,
 $\therefore 2(108 - x) = 7x$, $216 = 9x$, $x = 24$
43. If Stephanie has $\$(156 - x)$, Helen will have $\$(18 + x)$,
 $\therefore 5(156 - x) = 18 + x$, $780 - 5x = 18 + x$, $6x = 762$, $x = 127$

44. No. of boys = x , no. of girls = $(1 - \frac{1}{3})x = \frac{2}{3}x$,
 $\therefore x + \frac{2}{3}x = 40$, $x = 24$, \therefore no. of girls = $\frac{2}{3}(24) = 16$
45. Speed of B = x km/h, speed of A = $2x$ km/h, $\therefore 3(2x + x) = 387$,
 $3x = 129$, $x = 43$, \therefore speed of A = $2(43) = 86$ km/h
46. Speed of boat in still water = x m/s,
 $\therefore (x + 3) \times 5 \times 60 = 2400$, $x + 3 = 8$, $x = 5$
47. $18m - 24 = -24 + 18m$; since L.H.S. = R.H.S. for all values of m ,
 $\therefore m$ can be any real numbers.
48. $a - 55 - 5a = -3a + 21 - a$, $-4a - 55 = -4a + 21$, $-55 = 21$;
 since L.H.S. \neq R.H.S. for any values of a , \therefore no solution.
53. $\frac{3-x}{4} \times 8 - \frac{2x+1}{8} \times 8 = \frac{1}{2} \times 8$, $2(3-x) - (2x+1) = 4$,
 $6 - 2x - 2x - 1 = 4$, $-4x = -1$, $x = \frac{1}{4}$
54. $5 \times 12 - \frac{x-3}{6} \times 12 = \frac{x+2}{4} \times 12$, $60 - 2(x-3) = 3(x+2)$,
 $60 - 2x + 6 = 3x + 6$, $-5x = -60$, $x = 12$
56. $\frac{x}{0.4} \times 1.2 - \frac{x}{0.6} \times 1.2 = 10 \times 1.2$, $3x - 2x = 12$, $x = 12$
57. $1 \times 3 + \frac{2x-5}{3} \times 3 = 4x \times 3$, $3 + 2x - 5 = 12x$, $-10x = 2$, $x = -\frac{1}{5}$
61. $\frac{y+2}{3} \times 12 - \frac{y-1}{2} \times 12 = \frac{6-y}{4} \times 12$, $4(y+2) - 6(y-1) = 3(6-y)$,
 $4y + 8 - 6y + 6 = 18 - 3y$, $y = 4$
63. No. of wrong answers = x , no. of correct answers = $20 - x$,
 $\therefore 2(20 - x) - x = 25$, $40 - 2x - x = 25$, $-3x = -15$, $x = 5$
64. Present age of son = x , present age of father = $55 - x$,
 $\therefore 55 - x - 3 = 6(x - 3)$, $52 - x = 6x - 18$, $-7x = -70$, $x = 10$
65. Speed of Y = x km/h, speed of X = $2x$ km/h,
 $\therefore (2x - x) \times \frac{40}{60} = 48$, $x \times \frac{2}{3} = 48$, $x = 72$,
 \therefore speed of X = $2(72) = 144$ km/h

UNIT 5 PERCENTAGES (1)

1. D 2. D 3. A 4. D 5. B 6. C 7. D 8. D
 9. C 10. B 11. C 12. C 13. B 14. C 15. C 16. A
 17. A 18. B 19. B 20. A 21. C 22. C 23. A 24. B
 25. D 26. D 27. C 28. D 29. C 30. B 31. D 32. C
 33. C 34. C 35. C 36. C 37. C 38. B 39. B 40. D
 41. D 42. A 43. A 44. C 45. B 46. C 47. A 48. D
 49. C 50. A 51. B 52. D 53. B 54. A 55. B 56. A
 57. D 58. D 59. B 60. D 61. C 62. D 63. D 64. D
 65. A 66. C 67. C 68. B 69. A 70. D 71. A 72. A
 73. D 74. C

Explanatory Notes

6.
$$= \frac{1\% \times 10\% \times 1}{0.1\% \times 0.1\%} = \frac{1 \times 10}{0.1 \times 0.1} = 1000$$
11. $\frac{5y}{18} = 7.5, \therefore y = 7.5 \times \frac{18}{5} = 27 = 2700\%$
17. Man : $\$P \times 38\%$, Yen : $\$P(1 - 38\%)$,
 \therefore percentage = $\frac{P(1 - 38\%)}{P \times 38\%} \times 100\%$
18. Alice : y g, Zeta : $(y \div 92\%)$ g, $\therefore y + y \div 92\% = 288$
19. Percentage = $\frac{50 \times (1 - 70\%) \times 60\%}{50} \times 100\% = 18\%$
20. No. of junior students joined = x , $80 \times 75\% + x = (80 + x) \times 80\%$,
 $60 + x = 64 + 0.8x$, $x = 20$
22. % change = $\frac{75 - 80}{80} \times 100\% = -6\frac{1}{4}\%$, \therefore % decrease = $6\frac{1}{4}\%$
32. Percentage increase in width = $r\%$,
 $24(1 + r\%) \times 25(1 - 20\%) = 24 \times 25$, $1 + r\% = \frac{5}{4}$, $r\% = \frac{1}{4} = 25\%$
33. Profit = $\$10560 \div 110\% + \$10560 = \$20160$
34. New speed = $\frac{180}{4} \times (1 + 20\%) = 54$ km/h,
 \therefore time saved = $4 - \frac{180}{54} = \frac{2}{3}$ h = 40 minutes
36. Ming's mark = $72 \div (1 - 25\%) = 96$

38. X's share = x , Y's share = $x \div (1 + 10\%) = \frac{10}{11}x$,
 $\therefore x + \frac{10}{11}x = 399$, $\frac{21}{11}x = 399$, $x = 209$
39. Percentage = $\frac{112 - 12 \times 7}{12 \times 7} \times 100\% = \frac{28}{84} \times 100\% = 33\frac{1}{3}\%$
40. $P = Q \times 20\%$, $P = \frac{1}{5}Q$, $\therefore Q = 5P = P \times 500\%$
41. $M = N(1 - 75\%)$, $M = \frac{1}{4}N$, $N = 4M$,
 \therefore percentage = $\frac{N - M}{M} \times 100\% = \frac{4M - M}{M} \times 100\% = 300\%$,
 i.e. N is 300% more than M.
42. $a = b(1 + 50\%)$, $a = \frac{3}{2}b$, $b = \frac{2}{3}a$,
 \therefore percentage = $\frac{a - b}{a} \times 100\% = \frac{a - \frac{2}{3}a}{a} \times 100\% = 33\frac{1}{3}\%$
 i.e. b is $33\frac{1}{3}\%$ more than a .
50. Cost = $132000 \div 110\% = \$120000$
51. Loss = $168 \div (1 - 4\%) - 168 = 175 - 168 = \7
52. Cost = $180 \times 1.2 = \$216$, selling price = $180 \times (1 - \frac{1}{6}) \times 1.8 = \270 ,
 \therefore profit % = $\frac{270 - 216}{216} \times 100\% = \frac{54}{216} \times 100\% = 25\%$
56. Amount saved = $408 \div (1 - 15\%) - 408 = 480 - 408 = \72
58. Selling price = $500(1 + 40\%)(1 - 25\%) = \525
59. Selling price = $2100(1 + 10\%)(1 - 10\%) = \2079 ,
 \therefore loss % = $\frac{2100 - 2079}{2100} \times 100\% = \frac{21}{2100} \times 100\% = 1\%$
60. Marked price = $(108 + 18) \div (1 - 10\%) = 126 \div 0.9 = \140
61. Discount % = $\frac{1}{1 + 4} \times 100\% = \frac{1}{5} \times 100\% = 20\%$
62. A. $\frac{1}{1 + 3} \times 100\% = 25\%$; B. 28%;
 C. $\frac{2}{5 + 2} \times 100\% = 28\frac{4}{7}\%$; D. 30%;
 \therefore the answer is D.

63. No. of students failed in either Paper 1 or 2 =
 $40 \times 25\% + 40 \times 15\% - 2 = 14$,
 \therefore no. of students passed in both papers = $40 - 14 = 26$
64. No. of Chinese boys = $1500 \times 65\% \times (1 - 40\%) = 585$
67. Drink expense = $300 \times 66\frac{2}{3}\% = \200 ,
 \therefore percentage = $\frac{200}{200 + 300} \times 100\% = \frac{200}{500} \times 100\% = 40\%$
68. New number = $400(1 - 15\%)(1 + 15\%) = 391$,
 \therefore % change = $\frac{391 - 400}{400} \times 100\% = \frac{-9}{400} \times 100\% = -2.25\%$
71. Amount paid by C = $600(1 - 30\%)(1 + 35\%) = \567 ,
 \therefore loss % = $\frac{600 - 567}{600} \times 100\% = \frac{33}{600} \times 100\% = 5.5\%$
72. Shop A : $510 \times (1 - 20\%) = \408 , Shop B : $440 \times (1 - 5\%) = \$418$,
 \therefore A is less than B by $418 - 408 = \$10$.
73. $M = 215 \div (1 - 14\%) = \250
74. Marked price = $3600 \times (1 + 25\%) = \4500 ,
 selling price = $3600 \times (1 + 10\%) = \3960 ,
 \therefore Discount % = $\frac{4500 - 3960}{4500} \times 100\% = \frac{540}{4500} \times 100\% = 12\%$

UNIT 6 LAWS OF INDICES (1)

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. A | 2. D | 3. B | 4. D | 5. C | 6. C | 7. A | 8. A |
| 9. D | 10. B | 11. A | 12. D | 13. C | 14. B | 15. D | 16. C |
| 17. A | 18. B | 19. C | 20. B | 21. B | 22. B | 23. A | 24. D |
| 25. A | 26. B | 27. A | 28. B | 29. A | 30. C | 31. A | 32. D |
| 33. C | 34. B | 35. B | 36. B | 37. A | 38. D | 39. D | 40. C |
| 41. C | 42. A | | | | | | |

Explanatory Notes

5. $\frac{64 - (-27)}{-32 + 81} = \frac{91}{49} = \frac{13}{7} = 1\frac{6}{7}$
7. $-1^{2000} - (-1)^{2000} = -1 - 1 = -2$ [$\because -1^{2000} = -(1^{2000})$]
9. $\therefore 2n$ is even, $\therefore (-1)^{2n} + 1 = 1 + 1 = 2$
21. $\frac{a + a + a}{a \times a \times a} = \frac{3a}{a^3} = \frac{3}{a^2}$
24. $3^9 \times 7^9 = (3 \times 7)^9 = 21^9$
26. $-(-a^5)^2 = -(a^{10}) = -a^{10}$
35. $4^5 + 4^5 + 4^5 + 4^5 = 4 \times 4^5 = 4^{5+1} = 4^6$

39. A. $4^5 = (2^2)^5 = 2^{10}$; B. $9^6 = (3^2)^6 = 3^{12}$;
 C. $8^3 = (2^3)^3 = 2^9$; D. $25^3 = (5^2)^3 = 5^6 \neq 5^5$,
 \therefore the answer is D.
40. $x^2 = 10$, $(x^2)^3 = 10^3$, $\therefore x^6 = 1000$
41. $2^7 \times 5^4 = 2^3 \times 2^4 \times 5^4 = 8 \times (2 \times 5)^4 = 8 \times 10^4 = 80000$
42. $4^7 \times 2^7 = (4 \times 2)^7 = 8^7$; $4^7 \times 2^7 = (2^2)^7 \times 2^7 = 2^{14} \times 2^7 = 2^{21}$;
 \therefore the answer is A.

UNIT 7 OPERATIONS OF SIMPLE POLYNOMIALS

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. B | 2. C | 3. B | 4. A | 5. A | 6. C | 7. A | 8. D |
| 9. A | 10. D | 11. B | 12. B | 13. C | 14. C | 15. B | 16. A |
| 17. B | 18. D | 19. A | 20. D | 21. C | 22. A | 23. B | 24. C |
| 25. B | 26. B | 27. B | 28. D | 29. C | 30. A | 31. D | 32. D |
| 33. A | 34. C | 35. A | 36. D | 37. B | 38. C | 39. B | 40. C |
| 41. C | 42. A | 43. B | 44. D | 45. B | | | |

Explanatory Notes

1. II. is wrong because there is a variable (變數) in the denominator (分母).
- III. is wrong because it involves the square root of a variable.
22. $(-2 + 7x^2 - 4x) - (-3x^2 - 6x + 5)$
 $= -2 + 7x^2 - 4x + 3x^2 + 6x - 5 = 10x^2 + 2x - 7$
23. Perimeter $= [(a^2 + 1) + (a^2 - 1)] \times 2 = 2a^2 \times 2 = 4a^2$ cm
29. $(2x - 3)^2 = (2x - 3)(2x - 3) = 4x^2 - 6x - 6x + 9 = 4x^2 - 12x + 9$
33. Area $= \frac{1}{2} \times (x + 7)(2x + 6) = \frac{1}{2}(2x^2 + 20x + 42)$
 $= (x^2 + 10x + 21)$ cm²
34. Total surface area $= 6(x - 1)(x - 1) = 6(x^2 - 2x + 1)$
 $= (6x^2 - 12x + 6)$ cm²
38. Coefficient of $x^2 = (1)(-1) + (-5)(1) = -6$;
 constant term $= -5(+2) = -10$
41. $y - (3 - y)(y + 1) = y - (3y + 3 - y^2 - y)$
 $= y - 3y - 3 + y^2 + y = y^2 - y - 3$

44. Lower base = height = $(x+3) + (x-1) = 2x+2$,
 $\therefore \text{area} = \frac{[(x+3) + (2x+2)](2x+2)}{2} = (3x+5)(x+1)$
 $= 3x^2 + 3x + 5x + 5 = (3x^2 + 8x + 5)$ sq. units
45. Total bus fare = $y(2y-1) + (y+1)(5-y)$
 $= 2y^2 - y + (5y - y^2 + 5 - y) = \$(y^2 + 3y + 5)$

UNIT 8 ESTIMATION IN NUMBERS AND MEASUREMENT

1. B 2. C 3. C 4. A 5. B 6. C 7. C 8. B
 9. D 10. B 11. D 12. A 13. D 14. B 15. C 16. A
 17. A 18. B 19. B 20. B

Explanatory Notes

3. $\approx 70 - 390 - 660 + 490 = -490$
4. $4925 \approx 4900$ which is divisible by 7 ;
 $0.327 \approx \frac{1}{3}$ which can divide $4900 \div 7 = 700$ easily.
5. A. 70 is too small, C. 75.4×6 is too complicated,
 D. 80 is too large, \therefore the best answer is B.
7. A. $\approx 40 \times 70 = 2800$, B. $\approx 40 \times 60 = 2400$,
 C. $\approx 50 \times 70 = 3500$, D. $\approx 40 \times 60 = 2400$,
 \therefore the answer is C.
8. $11.7 + 2.8 \times 6.04 \approx 12 + 3 \times 6 = 30 \neq 90$, \therefore the answer is B.
9. A. 14.1 and 25.4 cannot be rounded off to 20.
 B. $14.1 \approx 10$ and $19.6 \approx 10$ by the Front-end method, not 20.
 C. Compatible numbers have not been used.
 D. 20 can be regarded as the clustered value of 14.1, 25.4, 19.6 and 22.2,
 \therefore the answer is D.
10. $7.3 \div 42.1$ is grouped first using Translation strategy;
 $4831.5 \approx 4800$ and $7.3 \div 42.1 \approx \frac{7}{42} = \frac{1}{6}$,
 \therefore compatible numbers are used.

UNIT 9 BASIC GEOMETRY

1. A 2. D 3. B 4. D 5. B 6. C 7. A 8. A
 9. B 10. A 11. D 12. D 13. C 14. C 15. C 16. D
 17. C 18. C 19. B 20. B 21. A 22. C 23. A 24. A
 25. D 26. C 27. D 28. A 29. D 30. C 31. B 32. A
 33. C 34. D 35. C 36. B 37. C 38. D 39. B 40. B
 41. B 42. D 43. C 44. C 45. C 46. C 47. B 48. B
 49. B 50. A 51. A

Explanatory Notes

11. Counting from “6” to “2.5”,

$$\text{the angle} = 360^\circ \times \frac{8.5}{12} = 255^\circ$$

12. I. $\therefore \angle ABX = \angle XBY$ and $\angle XBY = \angle CBY$,

$$\therefore \angle ABX = \angle XBY = \angle CBY$$

II. $\angle ABY = \angle ABX + \angle XBY = \angle CBY + \angle XBY = \angle CBX$

III. $\angle ABC = \angle ABX + \angle XBY + \angle CBY = 3\angle XBY$

\therefore I, II and III are true.

13. $\angle DOE = \angle EOB = 15^\circ$, $\angle COD = \angle DOB = 15^\circ + 15^\circ = 30^\circ$,

$$\angle AOC = \angle COB = 30^\circ + 30^\circ = 60^\circ,$$

$$\therefore \angle AOE = 60^\circ + 30^\circ + 15^\circ = 105^\circ$$

25. By counting, there are 9 diagonals.

(OR : Every vertex forms 3 diagonals with other non-adjacent vertices, but in this way each diagonal is counted twice,

$$\therefore \text{the no. of diagonals} = 6 \times 3 \div 2 = 9)$$

30. I.



- II.



- III.



\therefore The answer is C.

32. Uniform cross-section of

B:



C:



D:



41. The angle moved by the hour-hand in 1h = $\frac{1}{12} \times 720^\circ = 30^\circ$.

$$\therefore \text{The marked angle} = 30^\circ \times 2 + 30^\circ \times \frac{3}{12} = 67.5^\circ$$

45. It can be cut into 4 Δ s, \therefore sum = $180^\circ \times 4 = 720^\circ$

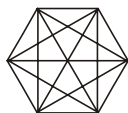
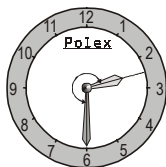
46. It can be cut into 4 Δ s, \therefore sum = $180^\circ \times 4 = 720^\circ$

49. No. of vertices : 6, 5

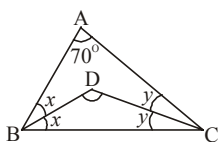
No. of faces : 5, 5

No. of sides : 9, 8

\therefore The answer is B.




50. The figure is composed of 2 Δ s,
 $\therefore \text{sum} = 180^\circ \times 2 = 360^\circ$
51. $2x + 2y + 70^\circ = 180^\circ$, $2x + 2y = 110^\circ$,
 $x + y = 55^\circ$,
 $\therefore \angle D = 180^\circ - (x + y) = 180^\circ - 55^\circ = 125^\circ$



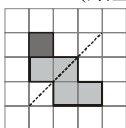
UNIT 10 SYMMETRY AND TRANSFORMATION

1. A 2. C 3. D 4. B 5. D 6. B 7. C 8. C
 9. D 10. D 11. B 12. C 13. B 14. A 15. C 16. D
 17. B 18. A 19. B 20. C 21. B 22. C 23. D 24. A
 25. B 26. C 27. A 28. A 29. C 30. D 31. D 32. B
 33. A 34. D

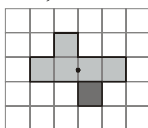
Explanatory Notes

1.  Vertical (鉛垂)
2. A. 2, 2 B. 1, 1
 C. 3, 3 D. 2, 4

27.



28.



UNIT 11 CONGRUENCE AND SIMILARITY

1. C 2. C 3. B 4. A 5. D 6. B 7. D 8. C
 9. A 10. D 11. A 12. B 13. B 14. D 15. A 16. D
 17. C 18. D 19. A 20. B 21. C 22. B 23. B 24. C
 25. A 26. C 27. A 28. C 29. D 30. B 31. B 32. A
 33. B 34. C 35. A 36. C 37. D 38. B 39. A 40. D
 41. C 42. D 43. B 44. A 45. C 46. D 47. B 48. C
 49. A 50. D 51. A 52. D 53. C 54. B 55. C 56. A
 57. B

Explanatory Notes

28. $\frac{3}{y} = \frac{1}{1+2}$, $\therefore y = 9$
30. $\frac{DE}{DG} = \frac{DF}{DH}$, $\frac{3}{4+FG} = \frac{4}{3+13}$, $16 + 4FG = 48$, $FG = 8$

32. $\frac{4}{5} = \frac{6}{6+a}$, $24 + 4a = 30$, $a = 1.5$
34. $\frac{ML}{KL} = \frac{KL}{NL}$, $\frac{2}{6} = \frac{6}{MN+2}$, $2MN + 4 = 36$, $MN = 16$
35. $x + 85^\circ = 120^\circ$, $x = 35^\circ$; $y = x = 35^\circ$
40. In $\triangle ABC$ and $\triangle EDC$, $\angle C = \angle C$ (common),
 $\angle ABC = \angle EDC = 100^\circ$ (given), $\angle A = \angle E$ (3^{rd} \angle of Δ),
 $\therefore \triangle ABC \sim \triangle EDC$ (A.A.A.)
41. In $\triangle ABC$ and $\triangle BDC$, $\frac{AB}{BD} = \frac{7}{10.5} = \frac{2}{3}$, $\frac{AC}{BC} = \frac{4}{6} = \frac{2}{3}$, $\frac{BC}{DC} = \frac{6}{9} = \frac{2}{3}$,
 $\therefore \triangle ABC \sim \triangle BDC$ (3 sides proportional)
43. Congruent Δ s have the same shape, and the ratio of lengths = 1 : 1
47. In $\triangle ACE$ and $\triangle ADE$, $AE = AE$ (common), $\angle AEC = \angle AED = 90^\circ$
(given), $CE = DE$ (given), $\therefore \triangle ACE \cong \triangle ADE$ (S.A.S.)
50. I. $AB = BC = CD = DC$ (corr. sides, $\cong \Delta$ s)
II. $\angle EAB = \angle FBC$ (corr. \angle s, $\cong \Delta$ s), $\angle ABE + \angle EAB + 90^\circ = 180^\circ$
(\angle sum of Δ), $\angle ABE + \angle EAB = 90^\circ$,
 $\therefore \angle ABE + \angle FBC = 90^\circ$, i.e. $\angle ABC = 90^\circ$
III. By II, $\angle ABC = \angle BCD = \angle CDA = \angle DAB = 90^\circ$, and by I,
 $ABCD$ is a square.
51. $CG = AE = 5$ cm, $FG = 8 - 5 = 3$ cm, $\therefore EFGH$ is a square,
 \therefore area of $EFGH = 3 \times 3 = 9$ cm²
52. Let $\angle C = x$, $\therefore \angle CBD = 180^\circ - 90^\circ - x = 90^\circ - x$,
 $\angle A = 180^\circ - 90^\circ - x = 90^\circ - x$,
 $\angle ABD = 90^\circ - \angle CBD = 90^\circ - (90^\circ - x) = x$
The 3 \angle s of $\triangle ABD$, $\triangle BCD$ and $\triangle ACB$ are $(90^\circ - x)$, 90° and x ,
 \therefore they are similar (A.A.A.)
53. $\frac{a+9}{9} = \frac{15}{6} = \frac{5}{2}$, $2a + 18 = 45$, $2a = 27$, $a = 13.5$
54. In $\triangle ABC$ and $\triangle CDE$, $\angle A = 180^\circ - 90^\circ - \angle ACB$ (\angle sum of Δ),
 $\angle ECD = 180^\circ - 90^\circ - \angle ACB$ (straight angle),
 $\therefore \angle A = \angle ECD$; $\angle B = \angle D = 90^\circ$ (given);
 $\angle ACB = \angle CED$ (3^{rd} \angle of Δ), $\therefore \triangle ABC \sim \triangle CDE$ (A.A.A.),
 $\therefore \frac{3}{CD} = \frac{5}{15}$, $CD = 3 \times \frac{15}{5} = 9$, $\therefore BD = 4 + 9 = 13$
55. By $\sim \Delta$ s, $\frac{5}{9+6} = \frac{9}{m+5}$, $5m + 25 = 135$, $5m = 110$, $m = 22$
56. By $\sim \Delta$ s, $\frac{y}{10} = \frac{10}{25}$, $y = \frac{10}{25} \times 10 = 4$
57. There are 4 Δ s in the figure, namely a, b, c and d. The 6 pairs of $\sim \Delta$ s are (a,b), (a,c), (a,d), (b,c), (b,d) and (c,d).

UNIT 12 AREA AND VOLUME (1)

1. D 2. C 3. A 4. D 5. B 6. A 7. C 8. A
 9. B 10. B 11. D 12. B 13. C 14. B 15. B 16. A
 17. A 18. D 19. B 20. B 21. D 22. D 23. B 24. C
 25. B 26. C 27. D 28. A 29. A 30. C 31. A 32. D
 33. A 34. B 35. B 36. B 37. D 38. D 39. C 40. D
 41. B 42. C 43. A 44. A 45. D 46. A 47. B 48. C
 49. B 50. B 51. C 52. C

Explanatory Notes

9. Area = $(\frac{1}{2} \times 21 \times \frac{16}{2}) \times 2 = 168 \text{ cm}^2$

10. Area = $\frac{12 \times 10}{2} + \frac{12 \times 11}{2} = 60 + 66 = 126 \text{ cm}^2$

11. A. $\frac{25 \times 12}{2} = 150 \text{ cm}^2$

B. $10 \times 15 = 150 \text{ cm}^2$

C. $\frac{(7+17) \times 12.5}{2} = 150 \text{ cm}^2$

D. $\frac{19 \times 4}{2} + \frac{19 \times 12}{2} = 152 \text{ cm}^2$

\therefore The answer is D.

14. $a \times 4 = 5 \times 12$, $\therefore a = 60 \div 4 = 15$

15. Lower base = $x \text{ cm}$, $\frac{(10+x) \times 16}{2} = 320$, $10+x = 40$, $x = 30$

16. Perimeter = $(5+5+3+3.5+2.5+6) \times 2 = 50$

17. Area = $(2+1.5 \times 2) \times (2+0.5 \times 2) - 2 \times 2 = 5 \times 3 - 4 = 11 \text{ m}^2$

19. Area = $\frac{1}{2} \times 16 \times 16 + \frac{1}{2} \times 7 \times 7 + (\frac{1}{2} \times 7 \times 16) \times 2 = 128 + 24.5 + 112$
 $= 264.5 \text{ cm}^2$

20. A regular hexagon can be divided into 6 identical triangles, each of them has 6 cm as the base, $\frac{10.4 \text{ cm}}{2}$ as the height.

Area = $(\frac{1}{2} \times 6 \times \frac{10.4}{2}) \times 6 = 93.6 \text{ cm}^2$

26. Total surface area = $(\frac{1}{2} \times 12 \times 5) \times 2 + (5+12+13) \times 9$
 $= 60 + 270 = 330 \text{ cm}^2$

29. Volume = $3 \times 5 \times \frac{24-5 \times 2}{2} = 3 \times 5 \times 7 = 105 \text{ cm}^3$

32. New water level = $(6 \times 60) \div (12 \times 15) + 14 = 360 \div 180 + 14$

- $$= 2 + 14 = 16 \text{ cm}$$
36. Height = x cm, $\frac{(9+15)x}{2} \times 16 = 12^3$, $x = \frac{12 \times 12 \times 12}{24 \times 8} = 9$
37. Side = x cm, $6x^2 = 486$, $x^2 = 81$, $x = \sqrt{81} = 9$,
 \therefore volume = $9^3 = 729 \text{ cm}^3$
40. $\therefore \triangle ABC$, $\triangle ABE$ and $\triangle ABD$ share the same base (AB) and the same height, \therefore they have the same area.
41. $AZ = DZ = \frac{20}{2} = 10 \text{ cm}$, $DY = 6 \times 3 = 18 \text{ cm}$,
 $AX = 18 + 6 - 8 = 16 \text{ cm}$,
 \therefore shaded area = $20 \times 24 - \frac{8 \times 20}{2} - \frac{10 \times 18}{2} - \frac{10 \times 16}{2}$
 $= 480 - 80 - 90 - 80 = 230 \text{ cm}^2$
42. Shaded area = $18 \times 13 + 22 \times 9 - 13 \times 9 = 234 + 198 - 117 = 315 \text{ cm}^2$
43. $CD = 26 \div 6.5 = 4 \text{ m}$,
 \therefore shaded area = $10.5 \times 4 + 26 \div 2 = 42 + 13 = 55 \text{ m}^2$
44. area of $\triangle PST$ = area of PQRS - $45 - 27 = 2 \times$ area of $\triangle PQT - 72$
 $= 90 - 72 = 18 \text{ cm}^2$
48. Volume = $\frac{3 \times 1000}{1.5} = 2000 \text{ cm}^3$,
 \therefore thickness = $2000 \div (25 \times 16) \div 500 = 2000 \div 400 \div 500$
 $= 0.01 \text{ cm} = 0.1 \text{ mm}$
52. Shallow end : x m, deeper end : $(x + 3)$ m,
 $\frac{(x + x + 3) \times 50}{2} \times 10 = 2000$, $2x + 3 = 8$, $x = 2.5$

UNIT 13 INTRODUCTION TO COORDINATES

- | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. A | 2. B | 3. C | 4. C | 5. D | 6. A | 7. C | 8. A |
| 9. B | 10. A | 11. A | 12. D | 13. B | 14. C | 15. B | 16. C |
| 17. C | 18. B | 19. B | 20. D | 21. B | 22. C | 23. D | 24. C |
| 25. B | 26. C | 27. B | 28. B | 29. A | 30. D | 31. C | 32. A |
| 33. D | 34. D | 35. B | 36. C | 37. C | 38. B | 39. D | 40. A |
| 41. B | 42. C | 43. A | 44. A | 45. D | 46. B | 47. D | 48. C |
| 49. A | 50. C | 51. D | 52. D | 53. A | 54. B | 55. A | 56. D |
| 57. B | 58. A | 59. D | 60. C | | | | |

Explanatory Notes

5. y -coordinate = 0, $\therefore 1 - b = 0$, $b = 1$
14. $AB = (m + 6) - (m - 1) = m + 6 - m + 1 = 7$ units,
 $BC = (m - 1) - (m - 5) = m - 1 - m + 5 = 4$ units
16. $1 - (-k) = 6$, $1 + k = 6$, $\therefore k = 5$

17. A. XY is horizontal, $\therefore b = d$
 B. YZ is vertical, $\therefore c = e$
 C. $XY = a - c = 0 - c = -c$ units
 D. $YZ = d - f = d - 0 = d$ units
 \therefore The answer is C.

18.
$$\text{Area} = \frac{(7+13) \times 6}{2} = 60 \text{ sq. units}$$

19.
$$\text{Area} = \frac{5 \times 6}{2} + \frac{5 \times 6}{2} = 15 + 15 = 30 \text{ sq. units}$$

20.
$$\text{Area} = 5 \times 4 - \frac{5 \times 2}{2} - \frac{2 \times 2}{2} - \frac{3 \times 4}{2} = 20 - 5 - 2 - 6 = 7 \text{ sq. units}$$

23.
$$\text{Area} = (15 - 0) \times [9 - (-4)] = 15 \times 13 = 195 \text{ sq. units}$$

24.
$$\frac{(x-4) \times [10 - (-2)]}{2} = 48, 6(x-4) = 48, x-4 = 8, \therefore x = 12$$

25. Upper base = a ,
$$\frac{(a+11) \times 4}{2} = 30, a+11 = 15, a = 4,$$

\therefore x -coordinate of $P = 1 - 4 = -3, \therefore P = P_2$

30. $X'(a, b)$ reflects along y -axis $\rightarrow (-a, b)$ reflects along x -axis $\rightarrow X(-a, -b)$

31. $A(5, 2)$; distance from A to $L = 5 - (-3) = 8,$

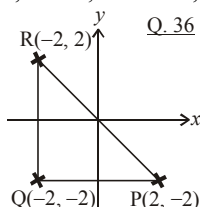
\therefore image of A is $(5 - 8 \times 2, 2) = (-11, 2)$

34. $H' = (3, -8) = (a+1, -b), \therefore a+1 = 3, a = 2; -b = -8, \therefore b = 8$

36. $P(2, -2) \rightarrow Q(-2, -2) \rightarrow R(-2, 2)$

$\therefore \text{Area} = \frac{[2 - (-2)] \times [2 - (-2)]}{2}$

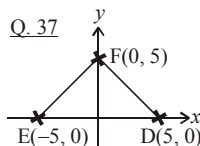
$$= \frac{4 \times 4}{2} = 8 \text{ sq. units}$$



37. $D(5, 0) \rightarrow E(-5, 0) \rightarrow F(0, 5),$

$\therefore \text{Area} = \frac{[5 - (-5)] \times (5 - 0)}{2}$

$$= \frac{10 \times 5}{2} = 25 \text{ sq. units}$$



42. $\therefore 275^\circ - 95^\circ = 180^\circ, \therefore AOB$ is a straight line,

$\therefore AB = 7 + 2 = 9$ units

43. \therefore reflex $\angle POQ = 290^\circ - 20^\circ = 270^\circ,$

$\therefore \angle POQ = 360^\circ - 270^\circ = 90^\circ, \therefore \text{area} = \frac{5 \times 8}{2} = 20$ sq. units

44. $\therefore \angle MON = 220^\circ - 160^\circ = 60^\circ$ and $OM = ON = 6,$

$\therefore \angle OMN = \angle ONM = (180^\circ - 60^\circ) \div 2 = 60^\circ,$

$\therefore \triangle OMN$ is equilateral, $\therefore MN = 6$ units

49. A. Distance = $6 - 0 = 6$ units
 B. Distance = $10 - 6 = 4$ units
 C. Distance = $4 - (-1) = 5$ units
 D. Distance = $-1 - (-4) = 3$ units
 \therefore The answer is A.
50. $(4q - 7) - (-2 - q) = 15$, $4q - 7 + 2 + q = 15$, $5q = 20$, $q = 4$
52. When A is on the left of B : $(2m - 7) - (m + 4) = 8$,
 $2m - 7 - m - 4 = 8$, $m = 19$.
 When A is on the right of B : $(m + 4) - (2m - 7) = 8$,
 $m + 4 - 2m + 7 = 8$, $m = 3$
53. $PS = QR = 3 - (-7) = 10$ units, $\therefore R = (-1 - 10, -12) = (-11, -12)$
55. Area = $11 \times 14 - \frac{8 \times 11}{2} - \frac{7 \times 2}{2} - \frac{(2 + 14) \times 4}{2}$
 $= 154 - 44 - 7 - 32 = 71$ sq. units
58. $\triangle XYZ$ is a right-angled \triangle . $XY = h$ units ; $YZ = k$ units ,
 \therefore area = $\frac{1}{2}hk$ units

UNIT 14 GRAPHS OF LINEAR EQUATIONS IN TWO UNKNOWNNS

1. B 2. D 3. C 4. A 5. C 6. B 7. C 8. C
 9. A 10. A 11. B 12. A 13. C 14. D 15. A 16. D
 17. B 18. A 19. C 20. C 21. A 22. D 23. A 24. D
 25. B 26. C 27. D 28. A 29. B 30. B 31. D 32. A
 33. B 34. C 35. D

Explanatory Notes

6. $6(4) - k(-5) - 14 = 0$, $24 + 5k - 14 = 0$, $k = -2$
7. $5\left(\frac{2}{3}\right) = 4 - 2a$, $10 = 12 - 6a$, $6a = 2$, $a = \frac{1}{3}$
9. $8(m) - 3m(-2) + 7 = 0$, $14m = -7$, $m = -\frac{1}{2}$
11. y -coordinate = 5, $\therefore 5 = -4x - 3$, $x = \frac{8}{-4} = -2$
12. Put $(-1, 0)$, $\therefore 2(0) = 5(-1) + k$, $k = 5$
21. $7(y + 4) = 7(-4 + 4) = 0$; $7(y - 4) = 7(-4 - 4) = -56$;
 $-6(x + 1) = -6(1 + 1) = -12$; $-6(x - 1) = -6(1 - 1) = 0$;
 $\therefore 7(y + 4) = -6(x - 1)$
24. $6(p - 1) - 5(p + 1) + 8 = 0$, $6p - 6 - 5p - 5 + 8 = 0$, $p = 3$
25. $B = (2a, a)$, $\therefore a = -2(2a) - 15$, $5a = -15$, $a = -3$,

- $\therefore B = (-6, -3)$
26. $(a, b) = (a, 9 - a)$, $\therefore 2(a) - 3(9 - a) + 7 = 0$, $2a - 27 + 3a + 7 = 0$,
 $5a = 20$, $a = 4$, $\therefore P = (4, 5)$
27. $P = (p, 0)$, $\therefore p + 0 - 8 = 0$, $p = 8$; $Q = (q, 0)$, $\therefore q + 0 + 3 = 0$,
 $q = -3$; $\therefore PQ = 8 - (-3) = 11$ units
28. $P = (p, 0)$, $\therefore p - 2(0) = 6$, $p = 6$; $Q = (0, q)$,
 $\therefore 0 - 2(q) = 6$, $q = -3$; $\therefore \text{area} = \frac{6 \times 3}{2} = 9$ sq. units
29. $A = (a, 0)$, $\therefore a + 0 = 5$, $a = 5$; $B = (0, b)$, $0 + b = 5$, $b = 5$;
 $C = (c, 0)$, $\therefore c - 0 = -5$, $c = -5$;
 $\therefore \text{area} = \frac{[5 - (-5)] \times 5}{2} = 25$ sq. units
30. $3(m) - (-2) + 7 = 0$, $3m + 9 = 0$, $m = -3$; $-2 = k(-3) - 5$, $3 = -3k$,
 $\therefore k = -1$
31. $1 + k = 4$, $k = 3$; $1 - 2(3) + a = 0$, $-5 + a = 0$, $\therefore a = 5$
32. y -coordinate of intersection point = 0, $0 = 4x - 6$, $x = \frac{6}{4} = \frac{3}{2}$;
 $0 = 6\left(\frac{3}{2}\right) + d$, $0 = 9 + d$, $\therefore d = -9$
33. Dicky obtains the basic salary when number of sales = 0. From the graph, when $x = 0$, $y = 4000$, \therefore basic salary = \$4000

UNIT 15 SIMPLE STATISTICAL GRAPHS (1)

1. A 2. C 3. C 4. B 5. C 6. B 7. A 8. A
 9. C 10. C 11. D 12. D 13. D 14. B 15. D 16. B
 17. C 18. B 19. A 20. A 21. C 22. A 23. C 24. C
 25. D 26. C 27. B 28. C 29. D 30. B 31. A 32. D
 33. D 34. C 35. B 36. B 37. C 38. D 39. A 40. B

Explanatory Notes

11. $y = 360^\circ \times \frac{10}{100} = 36^\circ$
12. Monthly salary = $1950 \div 30\% = \$6500$
14. The department store was losing money in the years in which sales < expenditure, i.e. 1999 and 2000.
19. Percentage = $\frac{200-100}{200} \times 100\% = \frac{100}{200} \times 100\% = 50\%$
20. % decrease = $\frac{250-150}{250} \times 100\% = \frac{100}{250} \times 100\% = 40\%$
21. % increase = $\frac{250-100}{100} \times 100\% = \frac{150}{100} \times 100\% = 150\%$
24. The required records are : 31, 35, 40 and 42, \therefore 4 days
25. x can be 5, 6, 7 and 8, \therefore 4 values
26. No. of girls with scores 50 or above = $5 + 3 + 2 = 10$,
 \therefore passing % = $\frac{10}{15} \times 100\% = 66\frac{2}{3}\%$
27. No. of students failed = $30 \times (1 - 80\%) = 6$. From the diagram, the lowest marks are from 31 to 47, \therefore the passing mark is 48.
28. y can be 0, 1 and 2.