7. \((2x)^2 + 4(2x) + 7 = 4x^2 + 8x + 7\)  
8. \((2x)^2 + 5x = 4x^2 + 5x\)  
9. \((3x + 2)^2 = 9x^2 + 12x + 4\)  
10. (a) \((-3)^2 + 5(-3) + 4 = 9 - 15 + 4 = -2\)  
(b) \((-3)^2 - 5(-3) + 4 = 9 + 15 + 4 = 28\)  
(c) \((-3)^2 + 5(-3) = 9 - 15 = -6\)  
11. \((y - 3)^2 = y^2 - 6y + 9\)  
12. \((z + 5)^2 = z^2 + 10z + 25\)  
13. \((2a + 3b)(a - b) = 2a^2 + ab - 3b^2\)  
14. \((a + 4)(a + 2) = a^2 + 6a + 8\)  
15. \((a - 4)(a - 2) = a^2 - 6a + 8\)  
16. \(\frac{3x^2}{3x^2} = 1\)  
17. \(\frac{3x^2 + 1}{3x^2} = \frac{3x^2}{3x^2} + \frac{1}{3x^2} = 1 + \frac{1}{3x^2}\)  
18. \(\frac{3x}{3x + 2} = \frac{3x}{3x + 2}\)  
19. \(\frac{3}{4x + 3} = \frac{3}{4x + 3}\)  
20. \(\frac{4x + 5}{4x} = \frac{4x}{4x} + \frac{5}{4x} = 1 + \frac{5}{4x}\)  
21. \(\frac{7x + 5}{5} = \frac{7x}{5} + \frac{5}{5} = \frac{7x}{5} + 1\)

**EXERCISE 15.1**

1. (a) 36.5° C  
(b) 12 noon  
(c) 1 p.m., 2 p.m.  
(d) 36.5° C; The point between 1 p.m. and 2 p.m. on the x-axis is equidistant from the two points showing 1 p.m. and 2 p.m., so it will represent 1.30 p.m. Similarly, the point on the y-axis, between 36° C and 37° C will represent 36.5° C.  
(e) 9 a.m. to 10 a.m., 10 a.m. to 11 a.m., 2 p.m. to 3 p.m.  
2. (a) (i) ₹ 4 crore  
(b) (i) ₹ 8 crore  
(c) ₹ 7 crore  
(b) (ii) ₹ 8.5 crore (approx.)  
(c) ₹ 4 crore  
(d) 2005  
3. (a) (i) 7 cm  
(b) (i) 9 cm  
(b) (i) 7 cm  
(b) (ii) 10 cm  
(c) 2 cm  
(d) 3 cm  
(e) Second week  
(f) First week  
(g) At the end of the 2nd week  
4. (a) Tue, Fri, Sun  
(b) 35° C  
(c) 15° C  
(d) Thurs  
6. (a) 4 units = 1 hour  
(b) 3 1/2 hours  
(c) 22 km  
(d) Yes; This is indicated by the horizontal part of the graph (10 a.m. - 10.30 a.m.)  
(e) Between 8 a.m. and 9 a.m.  
7. (iii) is not possible  

**EXERCISE 15.2**

1. Points in (a) and (b) lie on a line; Points in (c) do not lie on a line  
2. The line will cut x-axis at (5, 0) and y-axis at (0, 5)
3. O(0, 0), A(2, 0), B(2, 3), C(0, 3), P(4, 3), Q(6, 1), R(6, 5), S(4, 7), K(10, 5), L(7, 7), M(10, 8)

4. (i) True (ii) False (iii) True

**EXERCISE 15.3**

1. (b) (i) 20 km (ii) 7.30 a.m. (c) (i) Yes (ii) ₹ 200 (iii) ₹ 3500

2. (a) Yes (b) No

**EXERCISE 16.1**

1. A = 7, B = 6
2. A = 5, B = 4, C = 1
3. A = 6
4. A = 2, B = 5
5. A = 5, B = 0, C = 1
6. A = 5, B = 0, C = 2
7. A = 7, B = 4
8. A = 7, B = 9
9. A = 4, B = 7
10. A = 8, B = 1

**EXERCISE 16.2**

1. y = 1
2. z = 0 or 9
3. z = 0, 3, 6 or 9
4. 0, 3, 6 or 9

**JUST FOR FUN**

1. **More about Pythagorean triplets**
   
   We have seen one way of writing pythagorean triplets as \(2m, m^2 - 1, m^2 + 1\).

   A pythagorean triplet \(a, b, c\) means \(a^2 + b^2 = c^2\). If we use two natural numbers \(m\) and \(n(m > n)\), and take \(a = m^2 - n^2, b = 2mn, c = m^2 + n^2\), then we can see that \(c^2 = a^2 + b^2\).

   Thus for different values of \(m\) and \(n\) with \(m > n\) we can generate natural numbers \(a, b, c\) such that they form Pythagorean triplets.

   For example: Take, \(m = 2, n = 1\).
   
   Then, \(a = m^2 - n^2 = 3, b = 2mn = 4, c = m^2 + n^2 = 5\), is a Pythagorean triplet. (Check it!)

   For, \(m = 3, n = 2\), we get,
   
   \(a = 5, b = 12, c = 13\) which is again a Pythagorean triplet.

   Take some more values for \(m\) and \(n\) and generate more such triplets.

2. **When water freezes its volume increases by 4%. What volume of water is required to make 221 cm\(^3\) of ice?**

3. **If price of tea increased by 20%, by what per cent must the consumption be reduced to keep the expense the same?**