Ques 1 - 20	Ques 21 - 40
1. $f(x) = (x-1)(2x+5)(x-1)$	21. $f(x) = (x-1)(x+2)(x-1)$
2. $(x+4)^2 - 13$ Min T.P at $(-4, -13)$	22. $q = 5$
3. 2	23. $x = 2$
4. $x = \frac{2\pi}{3}$ for $\frac{\pi}{2} \le x \le \pi$	24. $x = \frac{\pi}{6}, \frac{11\pi}{6}$
5. $\sin(x+a) = \frac{4}{5}\sin x + \frac{3}{5}\cos x$	25. $\cos 2x = \frac{-3}{5}$
6. $\frac{dy}{dx} = 12x^2 + 10x - 3$	26. $f'(x) = 3x(4 - 3x^2)^{\frac{-3}{2}}$
7. Max T.P at $(-1, 17)$ and Min T.P. at $(3, -15)$	27. Max T.P. at (-1, 4) and Min T.P. at (1, 0)
8. $\frac{-2x^{-3}}{3} + \frac{1}{5}\sin 5x + C$	28. $\frac{8}{3}x^{\frac{3}{2}} - \frac{1}{2}x^{-2} + C$
9. $y = 4x^2 - 3x - 3$	29. $y = \frac{-1}{3}\cos 3x + \frac{7}{6}$
10. $k = 2$ and $a = 30°$	30. $\sqrt{2}\sin\left(x - \frac{\pi}{4}\right)$
11. $x \le 3$	31. $f(g(x)) = 3x^2 - 5$ $g(f(x)) = 9x^2 + 6x - 1$
12. $a = 2$ $b = 3$	32. $a = 3$ $b = 3$
13. $1:2$	33. $k = 4$
14. 26	34. $\overrightarrow{DE} = 3\overrightarrow{EF}$ so $\overrightarrow{DE}$ and $\overrightarrow{EF}$ are parallel. E is a common point so D,E,F are collinear.
15. $\sin 60 = \frac{\sqrt{3}}{2}$ $\tan\frac{\pi}{6} = \frac{1}{\sqrt{3}}$	35. Proof.
16. $m = -1$	36. $3y + 5x = -13$
17. $y = -3x + 10$	37. $m_{PS} = \frac{7}{4}$
18. $(x+7)^2 + (y-6)^2 = 36$	38. $4y + 5x = 71$
19. $u_{12} = 8.7$	39. $L = -400$
20. Area = 32 square units	40. Area = $12\frac{3}{20}$ square units.

Ques 41 - 60	Ques 61 - 80
41. $Y = 3(x-1)(x-4)$	61. $(x-1)(x+4)(x+5)$
42. $x > 3$ $x < -2$	62. $k = \frac{9}{8}$
43. $\log_a 5$	63. -4
44. $x = 0°, 60°, 300°, 360°$	64. $x = 60°, 132°, 228°, 300°$
45. $\sin(p+q) = \frac{2+2\sqrt{5}}{3\sqrt{5}}$	65. $\cos 2a = \frac{7}{25}$
46. $\frac{dy}{dx} = 6x^5 + 24x^2$	66. 14π
47. $y = 6x - 18$	67. $y = -x + 1$
48. $-2\cos(2x+3) + C$	68. $\frac{x^{-3}}{-9} + C$
49. $9\frac{1}{3}$	69. 1
50. $\sqrt{13}\sin\left(x - 303.7\right)$	70. $5\cos\left(x + 306.9°\right)$
51. 0.5	71. $f(g(x)) = x^2 + 8x + 19$ $g(f(x)) = x^2 + 7$
52. Correct shape, Min T.P at (-4, -4) Max T.P. at (-1, 1)	72. $q = 13$
53. $\begin{pmatrix} 8 \\ -4 \\ -5 \end{pmatrix}$	73. $3:2$
54. $x = 1$	74. $\frac{9}{2}$
55. Proof	75. $120° = \frac{3\pi}{4}$ and $\frac{2\pi}{3} = 120°$
56. $m = \frac{1}{\sqrt{3}}$	76. 5 units
57. $3y - x - 8 = 0$	77. $y = 4x + 4$
58. Centre $(-4, -2)$ radius$= \sqrt{58}$	78. $J(-1, -2)$ $K(1, 2)$
59. $u_3 = 29$	79. $l = 100/3$
	80. Area $= \frac{27}{4}$ square units

60. Area = $57\frac{1}{6}$ square units

Ques 81 - 100	**Ques 101 - 120**
81. $K = -2$ and $t = -5$	1014
82. $x > 0 \quad x < -4$	102. $q = -9$
83. $x = \frac{3}{8}$	103. $x = 2y^3$
84. $x = 30°, 90°, 150°$	104. $x = 20°, 100°, 140°, 220°, 260°, 340°$
85. $\sin(a + b) = \frac{63}{65}$	105. $sin2x = \frac{4}{5}$
86. $f'(x) = -\frac{1}{5}x^{-\frac{6}{5}}$	106. 1
87. $y = 4x - 2$	107 Max T.P. when $x = \frac{1}{3}$
88. $\frac{(2x-1)^{\frac{3}{2}}}{3} + C$	108. $x^3 + x^2 + c$
89. $\frac{2}{3}$	109. $f(x) = 2x + \frac{1}{x} + 5$
90. $\sqrt{34}\cos(x - 59.0)°$	110. $2.5\cos(x + 306.9)°$
91. $f(g(x)) = 9x^2 - 24x + 17 \quad g(f(x)) = 3x^2 - 1$	111. $x \neq 3 \ and \ x \neq 4$
92. $a = 4 \ b = 2 \ c = 1$	112 Correct shape drawn and labelled with
93. 3:2	$(0,3), (3,1), (5, 3)$
94. $\theta = 72°$	113. $Q(3, 1, -2)$
95. **-1**	114. t=-3
96. $y = \frac{1}{4}x + \frac{13}{4}$	115. Proof.
97. $y = \frac{3}{2}x - 3$	116. $m = 1$
98. Centre $(-1, -2)$ Radius $\sqrt{32}$	117. $y = -2x + 2$
99. $L = \frac{28}{3}$	118. $y = -\frac{3}{2}x + 6$
100 $Area = 9 \ square \ units$	119. $u_4 = 3$
	120. 9/8

Ques 121 - 140	**Ques 141 - 160**
121. $y = -x(x + 1)(x - 2)$	141. $(x - 4)(x - 2)(x + 1)$
122. $x < -5 \ and \ x > 3$	142. $x < -3 \ and \ x > 2$
123. 1	143. $k = 0.46$
124. $x = 60°, 120°, 240°, 300°$	144. $x = 45°, 105°, 225°, 285°$
125. Proof.	145. Proof.
126. 12	146. $\frac{dy}{dx} = -6x^{-3} + 3x^{\frac{1}{2}}$
127. $y = 2x - 12$	147. $y = 2x - 11$
128. $-\frac{(1-6x)^{\frac{1}{2}}}{3} + C$	148. $\frac{x^3}{3} + 4x^{-1} + C$
129. $y = 2x^3 - 2x^2 + 3x + 2$	149. $y = 2x^2 - 2x^3 + 5$
130. $10\cos(x + 36.9)°$	150. $x = 53.1°, 413.1°$
131. $p(x) = 3 - \frac{3}{x}$ and $p(q(x)) = x$	151. $f(g(x)) = 8x^2 + 80x + 195 \quad g(f(x)) = 8x^2$
132. $y = -2f(x)$ passing through (-6, 0), (1, 14), (3, 0) and $y = f(x - 3)$ passing through (-3, 0), (4, -7), (6, 0)	152. $y = f(x - 4)$ passing through $(0,5), (5, a)$ $y = 2 + f(x - 4)$ passing through $(0,7), (5, a + 2)$
133. $\overrightarrow{QR} = 2\overrightarrow{PQ}$ and Q is a common point so P, Q, R are collinear.	153. AB:BC = 1:2
134. 5	154. Unit vector = $\begin{pmatrix} \frac{4}{5} \\ 0 \\ \frac{-3}{5} \end{pmatrix}$
135. Proof.	
136. $y = -\frac{1}{2}x + \frac{13}{2}$	155. Proof.
137. $y = 6x + 9$	156. m=3
138. $y = \frac{1}{4}x - \frac{7}{2}$	157. $y = x$
139. $L = -50$	158. $(x + 2)^2 + (y - 3)^2 = 18$
140. Area = $\frac{20}{3}$ square units	159. $L = 60$
	160. $Area = \frac{343}{6}$ square units

Ques 161 - 180	**Ques 181 - 200**
161. $(x+2)(x-2)(x-2)$	181. $3(3x+1)(x+2)(x-1)$
162. $b^2 - 4ac = -24$	182. $-1 < x < \frac{1}{3}$
163. $x = \frac{43}{15}$	183. $x = 71$
164. $x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$	184. $x = 45°, 105°, 165°, 225°, 285°, 345°$
165. $Proof.$	185. $sin2a = \frac{15}{17}$
166. $\frac{dy}{dx} = -12 sinx cos^3 x$	186. $\frac{dy}{dx} = 2x cos(x^2 - 3)$
167. $Max\ T.P$ at (-1, 17). Min T.P at (3, -15).	187. $Min\ T.P\ at\ (0,0)\ Max\ T.P\ at\ (2,4)$
168. $2x^2 + \frac{1}{x} + C$	188. $\frac{(2x+9)^6}{12} + C$
169. $0.363\ radians$	189. $\frac{13}{3}$
170. $25sin(x - 1.287)$ (in radians)	190. $2sin(x + \frac{\pi}{3})$
171. $f\big(g(x)\big) = \frac{-x+2}{x+1}$ $g\big(f(x)\big) = \frac{1}{3x}$	191. $x \neq -8$, $x \neq 2$
172. $y = -g(x)\ passes\ through\ (a, -2), (0, -1), (b, -3)$ $y = 3 - g(x)\ passes\ through\ (a, 5), (0, 2), (b, 0)$	192. $y = 2f(x) + 1$ passes through $(0, 1), (2, 7), (5, 1)$
173. $|f + g| = \sqrt{66}$	193. $\overrightarrow{PQ} = \begin{pmatrix} 8 \\ -4 \\ 1 \end{pmatrix}$ $\left|\overrightarrow{PQ}\right| = 9$
174. $\theta = 50.9$	194. $k = \frac{6}{7}$
175. $Proof.$	195. $Proof.$
176. $y = \sqrt{3}x + 2\sqrt{3}$	196. $y = 3x + 7$
177. $y = -3x + 9$	197. $3y = 4x - 11$
178. Point of contact is $(1, 4)$	198. $P(1, -2)\ \ Q(3, 4)$
179. $u_9 = 9\ \ u_{10} = 6.8$	199. $u_1 = 16\ \ u_2 = 20\ \ u_3 = 21$
180. Area = 36 square units	200. Area $= \frac{9}{2}$ square units