

IM2 Book 2 Selected Answers

John Spence

March 2025

136. $\frac{12,400\pi}{3} + 800\sqrt{3} \text{ ft}^2$

137. (a) 46°

(b) 46°

138. $-$

139. $-$

140. $\frac{\pi}{4}$

141. (a) $1:8$

(b) $7:8$

142. 12.5

143. (a) $2k$

(b) $2k$

(c) $-$

144. $\angle BCA = 20^\circ$, $\angle CAB = 110^\circ$, $\widehat{AC} = 100^\circ$, major arc $\widehat{BC} = 220^\circ$

145. $-$

146. $-$

147. $-$

148. $-$

149. $-$

150. (a) $\frac{1}{2}$

(b) $\frac{1}{8}$

(c) $100\pi \text{ cm}^3$

(d) $\frac{25\pi}{2} \text{ cm}^3$

151. $\angle R = 67^\circ$, $\angle P = 126^\circ$

152. –
153. –
154. –
155. $1 : \sqrt[3]{2}$
156. $V = \frac{485\pi}{3}, LA = 55\sqrt{2}$
157. $104^\circ, 76^\circ$
158. $\frac{9}{4}$
159. $\frac{13.6}{\sin 63^\circ}$
160. –
161. –
162. $864\pi \text{ cm}^2$
163. $2\sqrt{2} \text{ in.}$
164. 90°
165. –
166. (a) $8:27$
(b) $2:3$
(c) –
167. $2\pi - 3\sqrt{3}$
168. 16 cm
169. (a) 70°
(b) $180 - k^\circ$
170. (a) $\frac{12.1}{\sin 48^\circ}$
(b) $\frac{a}{\sin A}$
171. $\frac{5\sqrt{3}}{3}$
172. –
173. $144\pi \text{ cm}^2$
174. $\frac{250\pi}{3}$
175. 21, 1
176. 30

177. –

178. Minor arc length = 11.07; major arc length = 20.34; $A_1 = 17.68$; $A_2 = 60.86$

179. $\frac{2\pi r^3}{3}$

180. (a) $39\pi \text{ cm}^2$

(b) $39\pi \text{ cm}^2$

181. –

182. $V_1 = \frac{1,280\pi}{3} - 320\sqrt{3}$, $V_2 = \frac{2,560\pi}{3} + 320\sqrt{3}$

183. $15, \sqrt{505}$

184. $L = 16$, $A_1 = 48$, $A_2 = 120$

185. –

186. tangent line: $y - 12 = \frac{1}{8}(x - 6)$

187. $2\pi - 4$

188. (a) $16h\pi - h^2\pi \text{ cm}^2$

(b) $16h\pi - h^2\pi \text{ cm}^2$

(c) –

(d) –

(e) $\frac{1,024\pi}{3} \text{ cm}^3$

(f) $\frac{2,048\pi}{3} \text{ cm}^3$

189. $\sqrt{r^2 - d^2}$

190. –

191. $\frac{29}{4}$

192. 66.33

193. (a) 120

(b) $25r$

(c) $\frac{24}{5}$

194. (a) –

(b) –

(c) 1

195. 4, 9, 13, 12

196. (a) $2\pi rh - \pi h^2 \text{ cm}^2$

- (b) $2\pi rh - \pi h^2 \text{ cm}^2$
 - (c) $-$
 - (d) $-$
 - (e) $\frac{2\pi r^3}{3} \text{ cm}^3$
 - (f) $\frac{4\pi r^3}{3} \text{ cm}^3$
197. 8 in.
198. 2.21 cm
199. $-$
200. (a) $-$
 (b) $R - r$
 (c) $-$
201. $1.5 - \frac{\sqrt[3]{19}}{2} \text{ cm}$
202. (a) $\frac{1}{3}$
 (b) $\frac{2}{3}$
203. $8\sqrt{3}$
204. $12\pi + 36 \text{ in.}$
205. $V = 9\sqrt{3}\pi, SA = 27\pi$
206. (a) 4.52 in.^2
 (b) 452 in.^2
207. $x^3 - y^3$
208. $-$
209. (a) $h = 8, V = 72\pi$
 (b) $V(r) = 2\pi r^2 \sqrt{25 - r^2}$
 (c) 302.30
210. (a) $-$
 (b) $\frac{2}{3}$ (Assume the sphere is tangent to both bases and the lateral surface of the cylinder)
211. (a) $-$
 (b) $y = -\frac{4}{3}(x - 4) + 3$
 (c) $(\frac{25}{4}, 0)$
 (d) $y = \frac{4}{3}(x - 4) - 3$

212. –
213. (a) $\frac{4}{3}\pi(R^3 - r^3)$
 (b) –
 (c) –
 (d) $BA = \frac{4}{3}\pi(R^2 + Rr + r^2)$
 (e) $4\pi R^2$
 (f) $SA = 4\pi R^2$
214. $3,364\pi cm^2$
215. (a) 67%
 (b) $LA = 12\pi r^2, SA = 12\pi r^2$
216. (a) 3 : 2
 (b) 9 : 4
 (c) 27 : 8
217. (a) 3
 (b) $r = \frac{w\sqrt{100-w^2}}{10+w}$
 (c) –
218. π
219. –
220. –
221. 57.30, 6
222. $y = -\frac{5}{12}(x - 13)$ or $y = \frac{5}{12}(x - 13)$
223. 80
224. $10\pi - 4\sqrt{3}$
225. Skip
226. 125 : 343
227. –
228. –
229. (a) $2\pi r$
 (b) πr
 (c) r

230. (a) $\frac{3}{2}$
(b) $\left(\frac{270}{\pi}\right)^\circ$

231. 15 in.

232. $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right), \left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$