IM2 Book 2 Selected Answers

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

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

145. –

146. –

147. –

148. –

149. –

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

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

     (c) $100\pi \; cm^3$

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

151. $\angle R = 67°$, $\angle P = 126°$

152. –

153. –

154. –

155. $1 : \sqrt[3]{2}$

156. $V = \frac{485\pi}{3}$, $LA = 55\sqrt{2}$

157. 104°, 76°

158. $\frac{9}{4}$

159. $\frac{13.6}{\sin 63°}$

160. –

161. –

162. $864\pi \ cm^2$

163. $2\sqrt{2} \ in.$

164. 90°

165. –

166.   (a) $8:27$

     (b) $2:3$

     (c) –

167. $2\pi - 3\sqrt{3}$

168. $16 \ cm$

169.   (a) 70°

     (b) $180 - k°$

170.   (a) $\frac{12.1}{\sin 48°}$

     (b) $\frac{a}{\sin A}$

171. $\frac{5\sqrt{3}}{3}$

172. –

173. $144\pi \ cm^2$

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) $39\pi \ cm^2$

     (b) $39\pi \ cm^2$

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) $16h\pi - h^2\pi \ cm^2$

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

     (c) –

     (d) –

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

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

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) $2\pi rh - \pi h^2 \ cm^2$

(b) $2\pi rh - \pi h^2 \; cm^2$

(c) –

(d) –

(e) $\frac{2\pi r^3}{3} \; cm^3$

(f) $\frac{4\pi r^3}{3} \; cm^3$

197. $8 \; in.$

198. $2.21 \; cm$

199. –

200. (a) –

(b) $R - r$

(c) –

201. $1.5 - \frac{\sqrt[3]{19}}{2} \; cm$

202. (a) $\frac{1}{3}$

(b) $\frac{2}{3}$

203. $8\sqrt{3}$

204. $12\pi + 36 \; in.$

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) $\left(\frac{25}{4}, 0\right)$

(d) $y = \frac{4}{3}(x - 4) - 3$

4

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

233. –

234. –

235. –

236. $A_{sector} = \frac{\theta r^2}{2}$, Arc length $= \theta r$

237. $\sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$, $\cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$

238. $\sin\left(\frac{\pi}{6}\right) = \frac{1}{2}$, $\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$

239. $\frac{\pi}{6} = 30°$, $\frac{\pi}{4} = 45°$, $\frac{\pi}{3} = 60°$, $\frac{\pi}{2} = 90°$