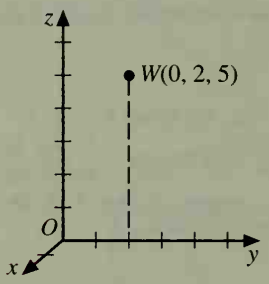
Appendices

Coordinates in Three Dimensions, Pages 718–719

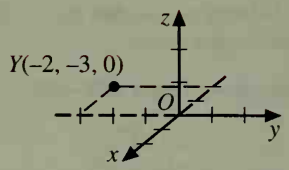
1. $A(0, 0, 3)$, $B(-3, 3, 3)$, $C(-3, 0, 0)$, $D(-3, 3, 0)$ **3.** xy-plane **5.** $\left(-\frac{3}{2}, \frac{3}{2}, \frac{3}{2}\right)$

7. xy-plane **9.** yz-plane

11.



13.



15. (0, 2.5, –3) **17.** (4.65, 1.25, –4.7) **19.** (4, –6, –13) **21.** 17 **23.** 9.8 **25.** equilateral **27.** $(GH)^2 + (HJ)^2 = 52 + 9 = 61 = (GJ)^2$; by the converse of the Pythagorean theorem, $\triangle GHJ$ is a right triangle. Its area is $\frac{1}{2} \cdot \sqrt{52} \cdot \sqrt{9} = 3\sqrt{13} \approx 10.8$ square units. **29.** 24 cubic units

Coordinates in Three Dimensions, Pages 721–722

1. The perimeter increases from 40 in. to 112 in. The area is multiplied by 4. **3.** The perimeter is multiplied by 2.5, from 40 in. to 100 in. The area is multiplied by $2.5^2 = 6.25$, from 96 in.^{2} to 600 in.^{2}. **5.** The area will be multiplied by 5. **7.** The area will be multiplied by $\frac{5}{2}$. **9.** No; for example, if the lengths of the bases are 16 and 20, then the new area is 108 square units, which is not double the original area. **11.** False; for example, if a rectangle that is 4 m long and 3 m wide is enlarged to be 10 m long and 4 m wide, then its perimeter doubles but its area increases by more than three times. **13.** True; if each side of a rhombus is changed from x to $\frac{x}{3}$, then the perimeter is changed from $4x$ to $\frac{4x}{3}$. **15.** 248 m^2; 240 m^3 **17.** If any one of the three dimensions is doubled, the volume will be doubled. **19.** The surface area is multiplied by c^2 and the volume is multiplied by c^3. **21.** No; $V = \frac{1}{3}\pi(3r)^2h = 9 \cdot \frac{1}{3}\pi r^2h$. The volume will be multiplied by 9. **23.** 6 oz

Relationships Among Sine, Cosine, and Tangent, Page 724

1. $\tan R = \frac{3}{4}$; $\frac{\sin R}{\cos R} = \frac{3}{5} \div \frac{4}{5} = \frac{3}{4}$ **3.** $\tan R = \frac{8}{15}$; $\frac{\sin R}{\cos R} = \frac{8}{17} \div \frac{15}{17} = \frac{8}{15}$ **5.** $(\sin R)^2 + (\cos R)^2 = \left(\frac{35}{37}\right)^2 + \left(\frac{12}{37}\right)^2 =$

$\frac{1225}{1369} + \frac{144}{1369} = \frac{1369}{1369} = 1$ **7.** $AB = 10$; $AC = 5\sqrt{3}$ **9.** $(\sin 30°)^2 + (\cos 30°)^2 = \left(\frac{5}{10}\right)^2 + \left(\frac{5\sqrt{3}}{10}\right)^2 = \left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 =$

$\frac{1}{4} + \frac{3}{4} = 1$ **11.** $\tan 45° = \frac{8}{8} = 1$; $\frac{\sin 45°}{\cos 45°} = \frac{8}{8\sqrt{2}} \div \frac{8}{8\sqrt{2}} = 1$ **13.** For example, $(0.5736)^2 + (0.8192)^2 = 1.0001056 \approx 1$

15. $\cos A = \frac{20}{29}$ and $\tan A = \frac{21}{20}$ **17.** $\sin D = \frac{7}{25}$ and $\cos D = \frac{24}{25}$ **19.** $(\tan A)^2 + 1 = \left(\frac{a}{b}\right)^2 + 1 = \frac{a^2}{b^2} + \frac{b^2}{b^2} = \frac{a^2 + b^2}{b^2} = \frac{c^2}{b^2}$

since $a^2 + b^2 = c^2$. Since $\frac{c^2}{b^2} = \left(\frac{c}{b}\right)^2 = \left(\frac{1}{\cos A}\right)^2$, $(\tan A)^2 + 1 = \left(\frac{1}{\cos A}\right)^2$.