

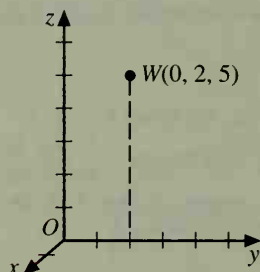
Appendices

Coordinates in Three Dimensions, Pages 718–719

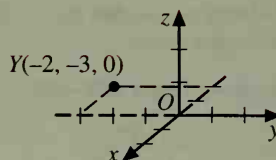
1. $A(0, 0, 3)$, $B(-3, 3, 3)$, $C(-3, 0, 0)$, $D(-3, 3, 0)$ 3. xy -plane 5. $\left(-\frac{3}{2}, \frac{3}{2}, \frac{3}{2}\right)$

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 m²; 240 m³ 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. $(\sin 30^\circ)^2 + (\cos 30^\circ)^2 = \left(\frac{5}{10}\right)^2 + \left(\frac{5\sqrt{3}}{10}\right)^2 = \left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{1}{4} + \frac{3}{4} = 1$ 11. $\tan 45^\circ = \frac{8}{8} = 1$; $\frac{\sin 45^\circ}{\cos 45^\circ} = \frac{8}{8\sqrt{2}} \div \frac{8}{8\sqrt{2}} = 1$ 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 $\frac{c^2}{b^2} = \left(\frac{c}{b}\right)^2 = \left(\frac{1}{\cos A}\right)^2$, $(\tan A)^2 + 1 = \left(\frac{1}{\cos A}\right)^2$.