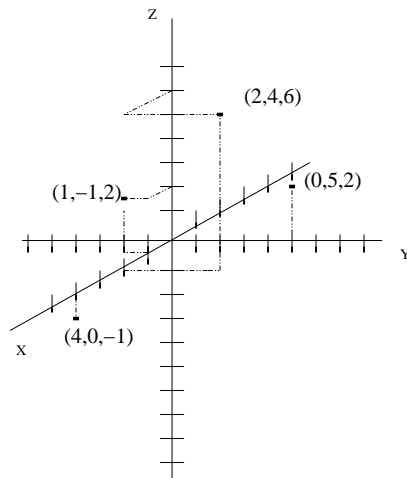


Answers to Even Exercises, Homework Set 1

Section 9.1 #2



#8 (a) 5, (b) 3, (c) 7, (d) $\sqrt{74}$, (e) $\sqrt{34}$, (f) $\sqrt{58}$

#10 $(x - 2)^2 + (y + 6)^2 + (z - 4)^2 = 25$

In the xy-plane, $z = 0$, so the intersection of the sphere and the

xy -plane is

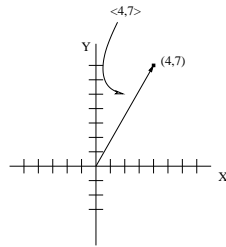
$$(x - 2)^2 + (y + 6)^2 + (0 - 4)^2 = 25$$

, or simplified $(x - 2)^2 + (y + 6)^2 = 9$ which is a circle with center $(2, -6)$ and radius 3.

The other intersections can be found analogously (notice, however, there is no intersection of the sphere with the xz -plane...why?)

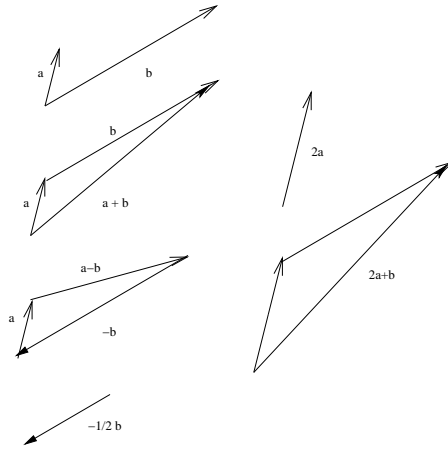
#30 $0 \leq x \leq 1, 0 \leq y \leq 2, 0 \leq z \leq 3$

Section 9.2 # 2



4 (a) \vec{PR} , (b) \vec{RS} , (c) \vec{QP} , (d) \vec{RQ}

#6



Section 9.3 #12 $\vec{A} \cdot \vec{P}$ will be the total amount of money he makes on that given day

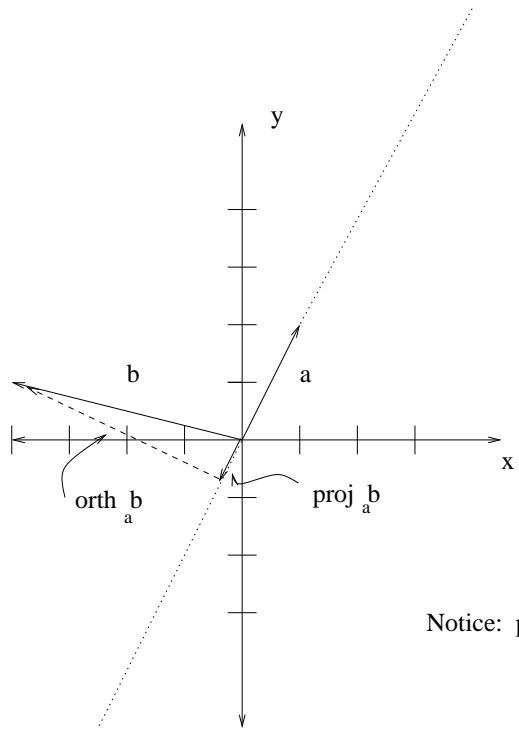
#16 the angles are approximately 107, 26, and 47 degrees (these are rounded to the nearest degree)

#18 (a) they are (anti)parallel, (b) neither, (c) perpendicular

24 the scalar projection is $\frac{-2}{\sqrt{5}}$, and the vector projection is

$$\frac{-2}{\sqrt{5}} \left\langle \frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}} \right\rangle = \left\langle -\frac{2}{5}, -\frac{4}{5} \right\rangle$$

28 $orth_{\vec{a}} \vec{b} = \langle -18/5, 9/5 \rangle$



Notice: $\text{proj}_a \mathbf{b} + \text{orth}_a \mathbf{b} = \mathbf{b}$