



# ÁLGEBRA LINEAL

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# Capítulo 6. Respuesta a los problemas impares

$$7. \left\{ \left( \begin{array}{c} -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} \\ 0 \end{array} \right), \left( \begin{array}{c} -\frac{\sqrt{2}\sqrt{3}}{6} \\ -\frac{\sqrt{2}\sqrt{3}}{6} \\ \frac{\sqrt{2}\sqrt{3}}{3} \end{array} \right) \right\}.$$

$$13. \left\{ \left( \begin{array}{c} -\frac{2\sqrt{26}}{13} \\ \frac{\sqrt{26}}{26} \\ \frac{3\sqrt{26}}{26} \end{array} \right) \right\}.$$

$$15. \left\{ \left( \begin{array}{c} \frac{a}{\sqrt{a^2+b^2+c^2}} \\ \frac{b}{\sqrt{a^2+b^2+c^2}} \\ \frac{c}{\sqrt{a^2+b^2+c^2}} \end{array} \right) \right\}.$$

$$17. \left\{ \left( \begin{array}{c} -\frac{\sqrt{2}}{2} \\ 0 \\ \frac{\sqrt{2}}{2} \\ 0 \\ 0 \end{array} \right), \left( \begin{array}{c} -\frac{2\sqrt{21}}{21} \\ -\frac{\sqrt{21}}{7} \\ -\frac{2\sqrt{21}}{21} \\ \frac{2\sqrt{21}}{21} \\ 0 \end{array} \right), \left( \begin{array}{c} \frac{13\sqrt{42}\sqrt{55}}{2310} \\ -\frac{2\sqrt{42}\sqrt{55}}{385} \\ \frac{13\sqrt{42}\sqrt{55}}{2310} \\ \frac{4\sqrt{42}\sqrt{55}}{1155} \\ \frac{\sqrt{42}\sqrt{55}}{55} \end{array} \right) \right\}.$$

$$19. \left\{ \left( \begin{array}{c} \frac{\sqrt{10}}{10} \\ \frac{3\sqrt{10}}{10} \end{array} \right), \left( \begin{array}{c} -\frac{3\sqrt{10}}{10} \\ \frac{\sqrt{10}}{10} \end{array} \right) \right\}.$$

$$33. \text{ a) } \text{proy}_H \mathbf{v} = \left( \begin{array}{c} \frac{4}{11} \\ \frac{5}{11} \\ \frac{17}{11} \end{array} \right). \text{ b) } H^\perp = \text{gen} \left\{ \left( \begin{array}{c} -\frac{3\sqrt{11}}{11} \\ -\frac{\sqrt{11}}{11} \\ \frac{\sqrt{11}}{11} \end{array} \right) \right\}.$$

$$\text{ c) } h = \left( \begin{array}{c} \frac{4}{11} \\ \frac{5}{11} \\ \frac{17}{11} \end{array} \right), p = \left( \begin{array}{c} \frac{18}{11} \\ \frac{6}{11} \\ -\frac{6}{11} \end{array} \right).$$

## 6.2 Aproximaciones por mínimos cuadrados

$$9. y = -\frac{17}{14} + \frac{787}{2100}x + \frac{253}{350}x^2 - \frac{37}{300}x^3.$$

13. a) La altura inicial fue de 15.2987 pies. b) La velocidad inicial fue de 19.0684 pies por segundo. c)  $g = -31.4258$ .

## 6.3 Espacios con producto interno y proyecciones

$$5. \left\{ \left( \begin{array}{c} \frac{1}{2} + \frac{1}{2}i \\ \frac{1}{2} - \frac{1}{2}i \end{array} \right), \left( \begin{array}{c} \frac{1}{2} - \frac{1}{2}i \\ \frac{1}{2} + \frac{1}{2}i \end{array} \right) \right\}.$$

## Ejercicios de repaso

$$1. \left\{ \left( \begin{array}{c} \frac{2\sqrt{5}}{5} \\ -\frac{\sqrt{5}}{5} \end{array} \right), \left( \begin{array}{c} -\frac{\sqrt{5}}{5} \\ \frac{2\sqrt{5}}{5} \end{array} \right) \right\}.$$

$$3. \left\{ \left( \begin{array}{c} \frac{\sqrt{5}}{5} \\ \frac{2\sqrt{5}}{5} \\ 0 \end{array} \right), \left( \begin{array}{c} \frac{3\sqrt{5}\sqrt{14}}{35} \\ -\frac{3\sqrt{5}\sqrt{14}}{70} \\ \frac{\sqrt{5}\sqrt{14}}{14} \end{array} \right) \right\}.$$

$$5. \left\{ \left( \begin{array}{c} -\frac{\sqrt{2}\sqrt{7}}{14} \\ \frac{3\sqrt{2}\sqrt{7}}{14} \\ \frac{\sqrt{2}\sqrt{7}}{7} \\ 0 \end{array} \right), \left( \begin{array}{c} \frac{5\sqrt{14}\sqrt{17}}{238} \\ -\frac{\sqrt{14}\sqrt{17}}{238} \\ \frac{2\sqrt{14}\sqrt{17}}{119} \\ \frac{\sqrt{14}\sqrt{17}}{17} \end{array} \right) \right\}.$$

$$11. B = \left\{ \frac{1}{2}, \frac{\sqrt{3}x}{4}, \frac{3\sqrt{5}(x^2 - \frac{4}{3})}{16} \right\}.$$

$$p(x) = 1 - \frac{\arctan(2)}{2} + \frac{15(7\arctan(2)-6)(x^2 - \frac{4}{3})}{128}.$$