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| Chapter 8 Vectors Review:  Topics: identify vector quantities (p.482), represent a vector geometrically (p.483), find the resultant of two vectors (p. 434), operations with vectors (p.485), rectangular components of vectors (p. 487), express a vector in component form (p.492, p.495), find direction angle (p.496), magnitude of vectors (p.493), operations with vectors using components (p. 493), find a unit vector with the same direction as a given vector (p.494), write a vector as a linear combination of unit vectors (p. 495), vector application problems (p.486, p.496) | | | | |
| 1. | State whether each quantity is a vector quantity:   1. a car driving 50 mph due east Answer: VECTOR 2. a gust of wind blowing 5 mph Answer: SCALAR 3. walking 4km east of west Answer:VECTOR 4. pushing down on an object with 7 Newtons of force Answer:VECTOR | 2. | **Use a ruler and a protractor to draw an arrow diagram for v = 10 newtons of force at 30° to the horizontal. Include a scale on the diagram.**  **Answer:**  *V* | |
| 3. | Find the resultant of:  **Vector 1: 2 kilometers N30°W**  **Vector 2: 2 kilometers directly east**  Answer: Can use a ruler and protractor **or** calculate the components of each vector and add them together. **2 kilometers at a bearing of 30° east of north or N30°E** | 4. | | **An airplane is flying with an airspeed of 475 miles per hour on a heading of 070°. If an 80-mile-per-hour wind is blowing from a true heading of 120°, determine the velocity and direction of the plane relative to the ground.**Answer: Can use a ruler and protractor **or** calculate the components of each vector and add them together. The velocity of the plane relative to the ground is about 428.0 miles per hour at a bearing of about 061.8° |
| 5. | **Will pushes a shovel into the ground with a force of 630 newtons at an angle of 70° with the ground. Draw a diagram that shows the vector and its rectangular components. Then calculate the rectangular components.**  **11Pcal_08_01_06_A_B**  horizontal component ≈ 215.47 Newtons vertical component ≈592.01 Newtons | 6. | | **A. Find the component form of a vector with an initial point *A*(1, –3) and terminal point *B*(1, 3)**  **Answer: <0,6>**  **B. Find the component form of a vector with an initial point *C*(–4, –3) and terminal point *D*(5, 3)**  **Answer: <9,6>** |
| 7. | **A. Find the magnitude of a vector with initial point *A*(1, –3) and terminal point *B*(1, 3)**  **Answer: 6**  **B. Find the magnitude of a vector with initial point *C*(4, –2) and terminal point *D*(–3, –2)**  **Answer: 7** | 8. | | **Find 2w + y for w = 〈2, –5〉, y = 〈2, 0〉, and  z = 〈–1, –4〉.**Answer:  〈6, –10〉 |
| 9. | **A. Find a unit vector u with the same direction as v = 〈4, –2〉.**  **Answer:**  Eqn05  **B. Find a unit vector u with the same direction as w = 〈5, –3〉.**  **Answer:**  Eqn08 | 10. | | **A. A vector has initial point *D*(*–*4, 3) and terminal point *E*(*–*1, 5). Rewrite the vector as a linear combination of the vectors i and j.**  Answer:  **3i + 2j**  **B. Vector=〈2, 9〉 Rewrite the vector as a linear combination of the vectors i and j.**  **Answer:**  **2i + 9j** |
| 11. | **Find the component form of the vector v with magnitude 7 and direction angle 60°.**  Eqn13 | 12. | | A. **Find the direction angle of r = –7i + 2j to the nearest tenth of a degree.** Eqn18  **B. Find the direction angle of p = 〈2, 9〉 to the nearest tenth of a degree.**  Eqn18 |
| 13. | **A soccer player running forward at 7 meters per second kicks a soccer ball with a velocity of 30 meters per second at an angle of 10° with the horizontal. What is the resultant speed and direction of the kick?**  **11Pcal_08_02_08_A_B**  Answer: 36.9 m/s; 8.1° | | | |