3

4

Vector Addition

|  |  |  |
| --- | --- | --- |
| 1. | For vectors and , determine the magnitude of the resultant . | |
|  | A. 17.2 N | B. 18.6 N |
|  | C. 19.2 N | D. 17.9 N |

|  |  |  |
| --- | --- | --- |
| 2. | For vectors and , determine the magnitude of the angle between the resultant and the horizontal reference line. | |
|  | A. | B. |
|  | C. | D. |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vectors in Three Dimensions

|  |  |  |
| --- | --- | --- |
| 3. | Determine a unit vector in the direction of . | |
|  | A. |  |
|  | B. |  |
|  | C. |  |
|  | D. |  |

|  |  |  |
| --- | --- | --- |
| 4. | Determine the direction angles, , for . | |
|  | A. |
|  | B. |
|  | C. |
|  | D |

|  |  |  |
| --- | --- | --- |
| 5. | Determine the magnitude of the projection of in the direction of . | |
|  | A. 0.76 lb | B. 0.54 lb |
|  | C. 0.67 lb | D. 0.60 lb |

|  |  |  |
| --- | --- | --- |
| 6. | Determine the angle between and . | |
|  | A. | B. |
|  | C. | D. |

|  |  |  |
| --- | --- | --- |
| 7. | Determine the magnitude of the resultant . | |
|  | A. 10.7 lb | B. 10.1 lb |
|  | C. 11.8 lb | D. 11.1 lb |

Particle Equilibrium in Two Dimensions – Part 1

8

|  |  |
| --- | --- |
| 8. | Sketch a Free Body Diagram of knot B. |

|  |  |  |
| --- | --- | --- |
| 9. | Determine the magnitude of the tension in cable segment AB. | |
|  | A. 619 N | B. 575 N |
|  | C. 583 N | D. 555 N |

|  |  |  |
| --- | --- | --- |
| 10. | Determine the magnitude of the tension in cable segment BC. | |
|  | A. 277 N | B. 264 N |
|  | C. 296 N | D. 247 N |

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**Cartesian Vectors in Two Dimensions.**

|  |  |  |
| --- | --- | --- |
| 11. | Determine a unit vector in the direction of force . | |
|  | A. | B. |
|  | C. | D. |

|  |  |  |
| --- | --- | --- |
| 12. | Determine the resultant force .        5  47°  kN  12 | |
|  | a. | b. |
|  | c. (9.18 | d. |

|  |  |  |
| --- | --- | --- |
| 13. | Determine the magnitude of the projection of force  in the direction of . | |
|  | a. 22.7 | b. 23.6 |
|  | c. 21.8 | d. 24.3 |

Particle Equilibrium in Three Dimensions

knot

12 ft

3 ft

Cables AD, BD, and CD are knotted together at D. They are anchored to the brick at A, B, and C. Cable CD is parallel to the y-axis. Knot D lies in the xy plane.

|  |  |
| --- | --- |
| 14. | Sketch a Free Body Diagram of knot D. |

|  |  |  |
| --- | --- | --- |
| 15. | Express the tension in cable AD as a Cartesian vector acting at D. | |
|  | A. | B. |
|  | C. | D. |

|  |  |  |
| --- | --- | --- |
| 16. | Express the tension in cable BD as a Cartesian vector acting at D. | |
|  | A. | B. |
|  | C. | D. |

|  |  |  |
| --- | --- | --- |
| 17. | Express the tension in cable CD as a Cartesian vector acting at D. | |
|  | A. | B. |
|  | C. | D. |

|  |  |  |
| --- | --- | --- |
| 18. | Determine the tension in Cable AD. | |
|  | A. 221 lb | B. 255 lb |
|  | C. 232 lb | D. 241 lb |

|  |  |  |
| --- | --- | --- |
| 19. | Determine the tension in Cable BD. | |
|  | A. 463 lb | B. 499 lb |
|  | C. 482 lb | D. 517 lb |

|  |  |  |
| --- | --- | --- |
| 20. | Determine the tension in Cable CD. | |
|  | A. 153 lb | B. 147 lb |
|  | C. 161 lb | D. 0 |