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| 1. Find parametric equations to represent the line segment from .  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 2. If a projectile is fired with an initial velocity of *v*0 meters per second at an angle α above the horizontal and air resistance is assumed to be negligible, then its position after *t* seconds is given by the parametric equations  ​  ​  where *g* is the acceleration of gravity . If a gun is fired with α = 55° and *v*0 = 440 m/s when will the bullet hit the ground?  ​   |  |  |  | | --- | --- | --- | |  | a. | *t* = 244 s | |  | b. | *t* = 74 s | |  | c. | *t* = 344 s | |  | d. | *t* = 124 s | |  | e. | *t* = 224 s |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 3. Describe the motion of a particle with position (*x*, *y*) as *t*varies in the given interval 0 ≤ *t ≤* 2π.  ​  ​   |  |  |  | | --- | --- | --- | |  | a. | Moves once counterclockwise along the circle *x*2+ *y*2= 1 starting and ending at (0, –6).  ​ | |  | b. | Moves once counterclockwise along the ellipse  starting and ending at  (0, 6).  ​ | |  | c. | Moves once counterclockwise along the ellipse  starting and ending at (–6, 0).  ​ | |  | d. | Moves once clockwise along the ellipse  starting and ending at (0, 6).  ​ | |  | e. | Moves once clockwise along the circle  starting and ending at (0, 6).  ​ |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 4. If  *a* and  *b* are fixed numbers, find parametric equations for the set of all points *P* determined as shown in the figure, using the angle *ang* as the parameter. Write the equations for *a* = 15 and *b =*6.  ​  ​  ​  ​  ​  ​  ​   |  |  | | --- | --- | | *ANSWER:* | ​  ​  ​  ​ | |

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| 5. Find parametric equations for the path of a particle that moves once clockwise along the circle  , starting at (4, 9).   |  |  | | --- | --- | | *ANSWER:* |  | |

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| 6. Eliminate the parameter to find a Cartesian equation of the curve.   |  |  | | --- | --- | | *ANSWER:* |  | |

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| 7. Sketch the parametric curve and eliminate the parameter to find the Cartesian equation of the curve.  ​  ​  ​   |  |  | | --- | --- | | *ANSWER:* | ​  ​  ​  ​  ​  ​  ​  ​ | |

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| 8. Eliminate the parameter to find a Cartesian equation of the curve.  ​   |  |  | | --- | --- | | *ANSWER:* | *x*= 6 – *y* | |

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| 9. Find the point(s) of intersection of the following two parametric curves, by first eliminating the parameter, then solving the system of equations.  ​   and  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. | (0, 0) and (1, 1) | |  | e. | (0, 0), (1, -1), and (1, 1) |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 10. Find the point(s) of intersection of the following two parametric curves, by first eliminating the parameter, then solving the system of equations.  ​   and  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. | (45, 900) and (5, 100) | |  | e. | (45, 900) and (900, 100) |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 11. Eliminate the parameter to find a Cartesian equation of the curve.  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 12. Find the parametric equations for the path of a particle that moves two and a half times clockwise around the circle , starting at .  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 13. Find parametric equations for the ellipse .  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 14. Let *P* be a point at a distance 6 units from the center of a circle of radius 2. The curve traced out by *P* as the circle rolls along a straight line is called a trochoid. (Think of the motion of a point on a spoke of a bicycle wheel.) Assuming the line is the *x*-axis and  when *P* is at one of its lowest points, find the parametric equations of the trochoid. (Hint: use the same parameter  as for the cycloid.)  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 15. Determine which of the following parametric equations matches the graph.  ​  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |