

Math 20C (Shenk). Quiz 1. August 8, 2011.

Name _____ Section number _____

Work alone and use no books, notes, or calculators. Justify your answers. Put your work on 8.5" × 11" paper and staple it to the quiz when you turn it in.

- Find the magnitude and an angle of inclination of the resultant (sum) \mathbf{F} of the force vectors $\mathbf{F}_1 = \langle 7, -1 \rangle$ (pounds) and $\mathbf{F}_2 = \langle -11, 5 \rangle$ (pounds).
- What is the angle θ at P ($0 \leq \theta \leq \pi$) in the triangle with vertices $P = (1, 1, 2)$, $Q = (2, 4, 3)$ and $R = (0, 1, 5)$?
- Give parametric equations of the line L through $P = (1, 2, 3)$ and $Q = (5, 2, 1)$.
- (a) Calculate $\langle 1, 2, 3 \rangle \times \langle 2, -1, 0 \rangle$. (a) Two sides of a triangle are formed by the vectors $\langle 1, 2, 3 \rangle$ and $\langle 2, -1, 0 \rangle$. What is its area?
- Give an equation of the plane through the point $(3, 2, 1)$ and perpendicular to the line $x = 5 + 4t, y = 6 + 3t, z = 7 + 2t$.
- Draw the curve $C: x = x(t), y = y(t), 0 \leq t \leq 3$, where $x = x(t)$ and $y = y(t)$ are the functions of Figures 1 and 2.

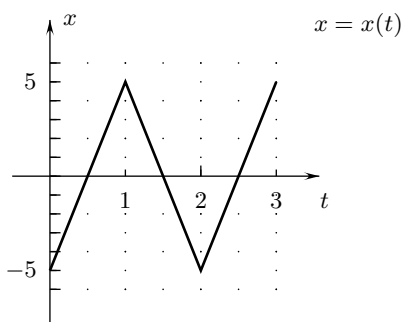


FIGURE 1

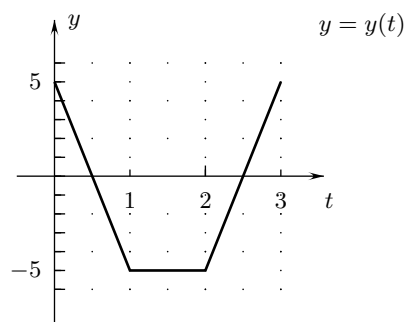


FIGURE 2

- At time t (minutes) for $-0.8 \leq t \leq 3.25$, an object is at $x = 3t - t^2, y = t^3 - 3t^2 + 1$ in an xy -plane with distances measured in meters. The object's path is shown in Figure 3. (a) Find its velocity vector at $t = 1$ and draw it with the curve. Use the scales on the axes to measure the components of the vector. (b) What is the object's speed at $t = 1$? (c) Give a definite integral that equals the length of the curve. Do not simplify the integrand or evaluate the integral.

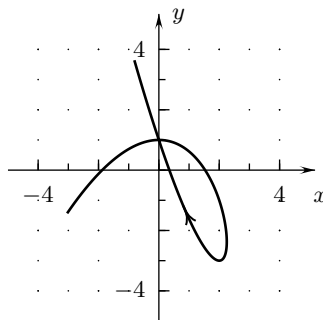


FIGURE 3