[1] $y = x^2 \pm 4x + 3$

[2] $y = \frac{1}{4}x^4 + x^2$

[3] $\sqrt{13}$

[4] $\langle 12, \pm 8 \rangle$

[5] 2

[6] $\langle -4, -2 \rangle$

[7] $\cos^{-1}\left(\frac{2}{\sqrt{20}\sqrt{13}}\right) \approx 82.9°$

[8] Let $\vec{u} = \langle u_1,\ u_2 \rangle$, $\vec{v} = \langle v_1,\ v_2 \rangle$, and $\vec{w} = \langle w_1,\ w_2 \rangle$. Then $\vec{u} \bullet \vec{v} + \vec{u} \bullet \vec{w} =$
$u_1v_1 + u_2v_2 + u_1w_1 + u_2w_2 = u_1(v_1 + w_1) + u_2(v_2 + w_2) = \vec{u} \bullet (\vec{v} + \vec{w})$.

[9] Let $\vec{u} = \langle u_1,\ u_2 \rangle$ and $\vec{v} = \langle v_1,\ v_2 \rangle$. Then $\vec{u} \bullet \vec{v} = u_1v_1 + u_2v_2 = v_1u_1 + v_2u_2 = \vec{v} \bullet \vec{u}$.

[10] $\left\langle \frac{2}{\sqrt{13}}, -\frac{3}{\sqrt{13}} \right\rangle$ and $\left\langle -\frac{2}{\sqrt{13}}, \frac{3}{\sqrt{13}} \right\rangle$

[11] $\langle 0, -2 \rangle$ and $\langle 0, 2 \rangle$

[12] $\langle 435 \cos 58°, 435 \sin 58° \rangle \approx \langle 230.5, 368.9 \rangle$

[13] $\langle 320 \cos 135°, 320 \sin 135° \rangle \approx \langle \pm 226.3, 226.3 \rangle$

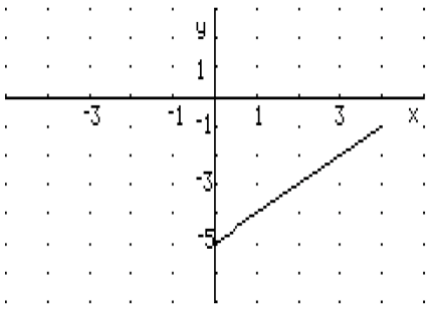
[14] ≈ 315 mph at $\approx 39.2°$N of E

[15] 1.3 mph moving upstream at an angle of $\approx 77.1°$ with the bank

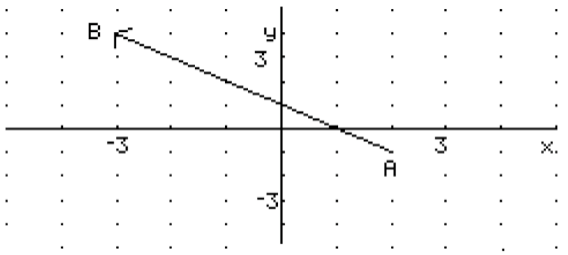
[16] $14\ \frac{\text{ft}}{\text{sec}}$

[17] 4 ft in front of the thrower, and 4 ft above the ground

[18] ≈ 4.2 ft from the initial point

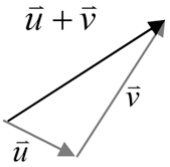
[19] 

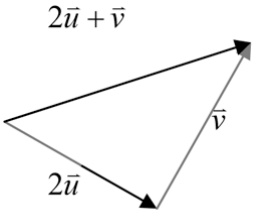
[20] The length of the segment would be twice as long.

[21] 

[22] $\langle -5, 5 \rangle$

[23] Answers may vary. Sample: $\left[5\sqrt{2}, 180° - \tan^{\pm 1}(1)\right]$ or $\left[5\sqrt{2}, 135°\right]$ or $\left[5\sqrt{2}, \frac{3\pi}{4}\right]$

[24] 

[25] 

[26] $\begin{cases} x = 1.5t + 3 \\ y = 7.33t - 2 \end{cases}$

[27] $\begin{cases} x = \pm 4t + 4 \\ y = 3.2t - 1 \end{cases}$