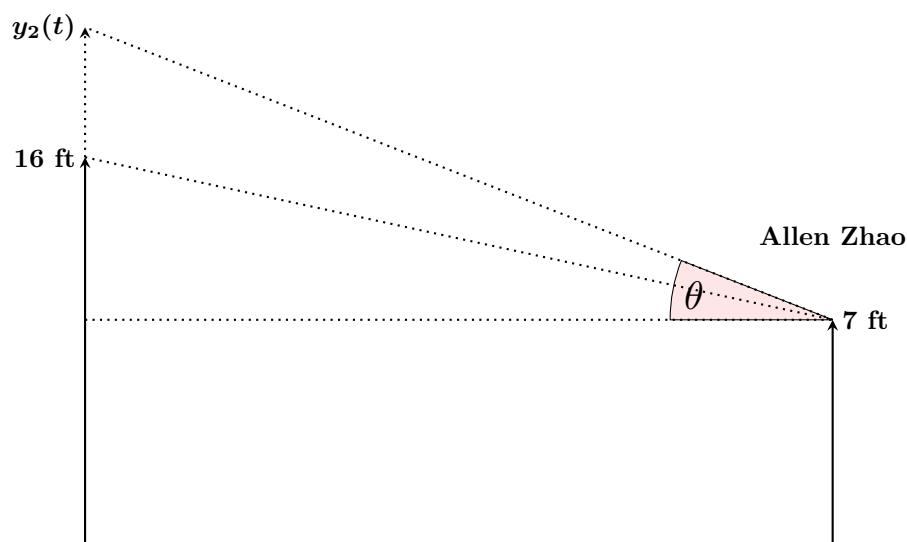# Chad Allen Zhao gets the hottest girl in the grade

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Allen Zhao and Tacko Fall go on a fast break with 20 seconds left on the game clock. Allen must pass it directly to Fall given that Allen is accelerating at $(0.5t^2+3)\frac{ft}{sec^2}$ with an initial velocity of $14\frac{ft}{sec}$ and an initial position of 7 ft from the half-court and Fall is accelerating at $(0.6t^2+3t)\frac{ft}{sec^2}$ with an initial velocity of $18\frac{ft}{sec}$ and an initial position of $16ft$ from the half-court. Allen throws the ball at $51\frac{ft}{sec}$. Violet, watching the crowd has already calculated the answer to her challenge to Allen: to find $\frac{d\theta}{dt}$ when he throws the basketball at his initial position. Now, Allen must do the same.

Tacko Fall

Tacko Fall

$y_2(t)$

$v_{ball} = 51\frac{ft}{sec}$

16 ft

Allen Zhao

θ

7 ft

$a_2(t) = 0.6t^2 + 3t\frac{ft}{sec^2}$

$a_1(t) = 0.5t^2 + 3\frac{ft}{sec^2}$

$v_2(t_0) = 18\frac{ft}{sec}$

$v_1(t_0) = 14\frac{ft}{sec}$

$y_2(t_0) = 16ft$

$y_1(t_0) = 7ft$