51) Find the acceleration of the top of the ladder when the base of the ladder is 7 feet from the wall. (Use problem 27)

$$a^2 + b^2 = 25^2$$

$$2a\frac{da}{dt} + 2b\frac{db}{dt} = 0$$

$$\frac{da}{dt} = -\frac{b}{a}\frac{db}{dt}$$

$$\frac{da}{dt} = -\frac{2b}{a}$$

$$\frac{d^2a}{dt^2} = \frac{-2\frac{db}{dt}a + 2b\frac{da}{dt}}{a^2} = \frac{-2(2)a + 2b\left(-\frac{7}{2}\right)}{a^2}$$

$$= \frac{-4(24) - \frac{7}{6}(7)}{(24)^2}$$

25 ft

24

7

$\downarrow \frac{-7}{12}\frac{ft}{sec}$

$2\ {}^{ft}/_{sec}$