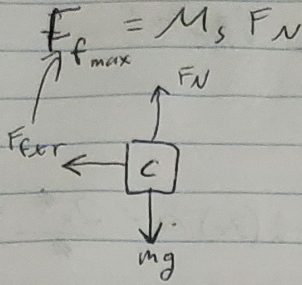
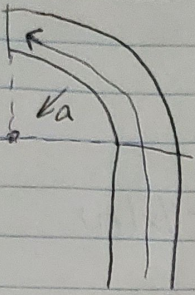


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1.



$$\sum F_y = mg - F_N = 0$$

$$\sum F_x = F_s = \mu_s mg = ma_c$$

$$a = \mu g$$

$$a = \frac{v^2}{r}$$

$$v^2 = ar$$

$$v = \sqrt{ar}$$

$$C = \pi d$$

$$40 = \pi d$$

$$\mu_s = 0.4$$

$$\frac{20}{\pi} = r = 6.37 \text{ m}$$

$$v = \sqrt{\mu g r} = \sqrt{0.4 \times 9.8 \times 6.37} = 5 \text{ m/s}$$

2.

$$a = \mu g$$

$$\mu = 0.1$$

$$g = 9.8$$

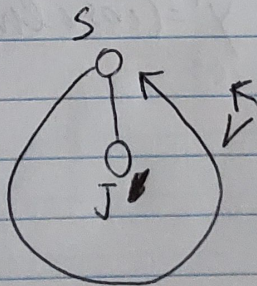
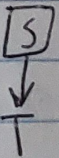
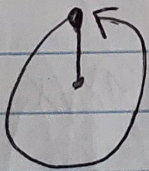
$$a = 0.98 \text{ m/s}^2$$

increased turning radius

3.

$$C = \pi d = 8.17 \text{ m}$$

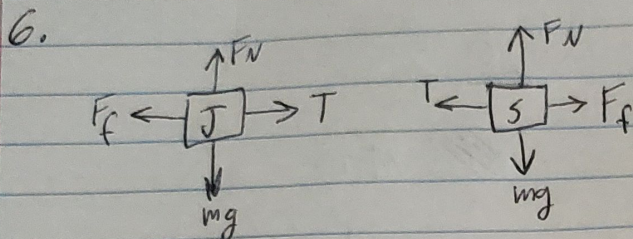
$$8.17 \text{ m} / 2 \text{ s} \rightarrow 4.09 \text{ m/s}$$



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4. $m_J = 80 \text{ kg}$ $m_S = 55 \text{ kg}$ $r = 1.3 \text{ m}$
 mass of Jack mass of Sue radius of circle sue is spinning in

5. 4.09 m/s



7. His forces in the x-direction will not be 0 and he will accelerate toward Sue because Tension will not be counteracted

8. $a = \frac{v^2}{r} \rightarrow \frac{4.09^2}{1.3} = 12.87 \text{ m/s}^2$

9. Sue is accelerating toward Jack because the Tension is acting toward Jack

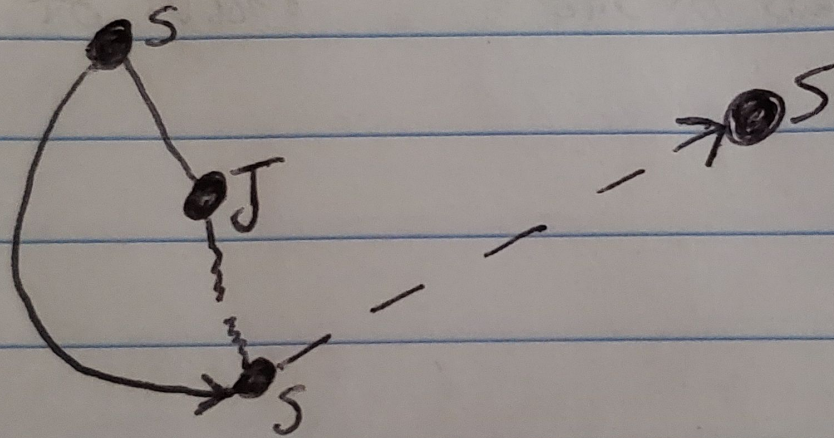
10. $\sum F_{x \text{ sue}} = a_s m_s = T$

$$F_{f, s, T} = \mu F_N \quad F_N = m_s g \cos \theta \quad \theta = 0$$

11. $\sum F_{x \text{ Jack}} = 0 = (m_s g) \mu - T$

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12.



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