

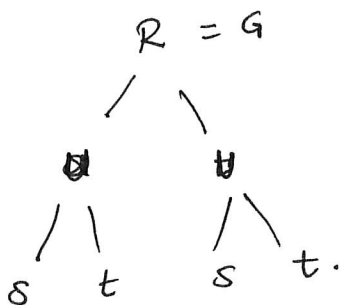
SECTION 14.5 - ANS TO EVEN PROBLEMS

14. $R(s,t) = G(u(s,t), v(s,t))$

$$\frac{\partial R}{\partial s} = \frac{\partial R}{\partial u} \cdot \frac{\partial u}{\partial s} + \frac{\partial R}{\partial v} \cdot \frac{\partial v}{\partial s}$$

$$\frac{\partial R}{\partial t} = \frac{\partial R}{\partial u} \cdot \frac{\partial u}{\partial t} + \frac{\partial R}{\partial v} \cdot \frac{\partial v}{\partial t}$$

from TREE diagram



When $s=1$ and $t=2$, $u(1,2) = 5$ and $v(1,2) = 7$

$$R_s(1,2) = G_u(5,7) \cdot u_s(1,2) + G_v(5,7) \cdot v_s(1,2) = (9)(4) + (-2)(2) = 32$$

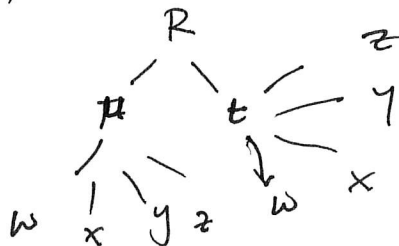
Similarly

$$R_t(1,2) = -39$$

20. $R = F(t,u)$

$$t = t(w,x,y,z)$$

$$u = u(w,x,y,z)$$



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$$\frac{dy}{dx} = \frac{-F_x}{F_y} = \frac{-\sin(xy)(y)}{-\sin(xy)(x) - \cos(y)}$$

$$34. \frac{\partial z}{\partial y} = \frac{-F_y}{F_z} = \frac{-\left(z + \left(\frac{x}{y}\right)\right)}{y - 2z}$$