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In[1]:= ClearAll["Global`*"]
$Assumptions = (rs ∈ Reals && rs > 0 &&
  r ∈ Reals && r > 0 &&
  m ∈ Reals && m > 0 &&
  J ∈ Reals && J > 0 &&
  e ∈ Reals && e > 0);
```

$$rpp = \frac{2 J^2 r - (3 J^2 + m^2 r^2) rs}{2 m r^4}; (* r'[r] \text{ from task 13a} *)$$

$$rp = - \frac{\sqrt{1 - \frac{rs}{r}} \sqrt{-\frac{J^2}{m^2 r} + r + \frac{e^2 r^3}{m^2 (r-rs)^2} - \frac{e^2 r^2 rs}{m^2 (r-rs)^2}}}{\sqrt{r}};$$

(\* Solve for J \*)

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Solve[rp == 0, J, Reals]
```

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Solve[rpp == 0, J, Reals]
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$$\text{Out[5]= } \left\{ \left\{ J \rightarrow \text{ConditionalExpression} \left[ -\sqrt{\frac{e^2 r^3 + m^2 r^3 - m^2 r^2 rs}{r - rs}}, (r > rs \&\& rs > 0) \parallel (rs < 0 \&\& r > 0) \right] \right\}, \right. \\ \left. \left\{ J \rightarrow \text{ConditionalExpression} \left[ \sqrt{\frac{e^2 r^3 + m^2 r^3 - m^2 r^2 rs}{r - rs}}, (r > rs \&\& rs > 0) \parallel (rs < 0 \&\& r > 0) \right] \right\} \right\}$$

$$\text{Out[6]= } \left\{ \left\{ J \rightarrow \text{ConditionalExpression} \left[ -\sqrt{\frac{m^2 r^2 rs}{2 r - 3 rs}}, \left( r > \frac{3 rs}{2} \&\& rs > 0 \right) \parallel \left( r < \frac{3 rs}{2} \&\& rs < 0 \right) \right] \right\}, \right. \\ \left. \left\{ J \rightarrow \text{ConditionalExpression} \left[ \sqrt{\frac{m^2 r^2 rs}{2 r - 3 rs}}, \left( r > \frac{3 rs}{2} \&\& rs > 0 \right) \parallel \left( r < \frac{3 rs}{2} \&\& rs < 0 \right) \right] \right\} \right\}$$