8.1

22. $\frac{JM}{4} = \frac{4}{8}$

$JM = 2$

23. $\frac{4}{6} = \frac{6}{MK}$

$9 = MK$

24. $\frac{3}{LM} = \frac{LM}{6}$

$LM = \sqrt{18} = 3\sqrt{2}$

25. $\frac{9}{LK} = \frac{LK}{5}$

$(9 - 4 = 5)$

$LK = \sqrt{45} = 3\sqrt{5}$

26. $\frac{12}{LJ} = \frac{LJ}{3}$

$(9 + 3 = 12)$

$LJ = 6$

27. $\frac{MK+3}{6} = \frac{6}{3}$

$36 = 3MK + 9$

$27 = 3MK$

$9 = MK$

28. $\frac{6+MK}{9} = \frac{9}{6}$

$81 = 36 + 6MK$

$45 = 6MK$

$\frac{15}{2} = MK = 7.5$

29. $\frac{6+JM}{3\sqrt{6}} = \frac{3\sqrt{6}}{6}$

$9 \cdot 6 = 36 + 6JM$

$18 = 6JM$

$3 = JM$

30. $\frac{6+JM}{7} = \frac{7}{6}$

$49 = 36 + 6JM$

$13 = 6JM$

$\frac{13}{6} = JM$

31. $\frac{4}{y} = \frac{y}{29}$ $\quad \frac{4}{x} = \frac{x}{25}$ $\quad \frac{25}{z} = \frac{z}{29}$

$y = 2\sqrt{29}$ $\quad x = 10$ $\quad z = 5\sqrt{29}$

32. $\frac{9}{x} = \frac{x}{7}$ $\quad \frac{9}{y} = \frac{y}{16}$ $\quad \frac{7}{z} = \frac{z}{16}$

$x = 3\sqrt{7}$ $\quad y = 12$ $\quad z = 4\sqrt{7}$

33. $\frac{1/6}{x} = \frac{x}{1/3}$ $\quad \frac{1/6}{y} = \frac{y}{1/2}$ $\quad \frac{1/3}{z} = \frac{z}{1/2}$

$x = \sqrt{\frac{1}{18}} = \frac{1}{\sqrt{18}}$ $\quad y = \sqrt{\frac{1}{12}} = \frac{1}{\sqrt{12}}$ $\quad z = \sqrt{\frac{1}{6}} = \frac{1}{\sqrt{6}}$

$\frac{1}{3\sqrt{2}} = \frac{\sqrt{2}}{6}$ $\quad \frac{1}{2\sqrt{3}} = \frac{\sqrt{3}}{6}$ $\quad \frac{\sqrt{6}}{6}$

34. $\frac{8}{x} = \frac{x}{8}$ $\quad \frac{8}{y} = \frac{y}{16}$ $\quad \frac{8}{z} = \frac{z}{16}$

$x = 8$ $\quad y = 4\sqrt{8} = 8\sqrt{2}$ $\quad z = 4\sqrt{8} = 8\sqrt{2}$

(35)

(1) $\frac{x}{9} = \frac{9}{15}$

$81 = 15x$

$5.4 = x$

(3) $\frac{x}{z} = \frac{z}{y}$

$\frac{5.4}{z} = \frac{z}{9.6}$

$z = 7.2$

(2) $y = 15 - 5.4$

$y = 9.6$

(36)

$\frac{2}{z} = \frac{z}{x-2}$

$\frac{2}{z} = \frac{z}{18-2}$

$\sqrt{32} = z$

$4\sqrt{2} = z$

(1) $\frac{2}{6} = \frac{6}{x}$

$36 = 2x$

$18 = x$

$\frac{x-2}{y} = \frac{y}{x}$

$\frac{18-2}{y} = \frac{y}{18}$

$y = \sqrt{288} = 6\sqrt{8}$

$y = 12\sqrt{2}$

(37)

$\frac{x}{y} = \frac{y}{\sqrt{2}+x}$

$\frac{\sqrt{2}}{y} = \frac{y}{\sqrt{2}+\sqrt{2}}$

$y^2 = \sqrt{2} \cdot 2\sqrt{2} = 4$

$\boxed{y = 2}$

$\frac{x}{z} = \frac{z}{\sqrt{2}}$

$\frac{\sqrt{2}}{z} = \frac{z}{\sqrt{2}}$

$\boxed{z = \sqrt{2}}$

(1) $\frac{\sqrt{2}}{2} = \frac{2}{\sqrt{2}+x}$

$4 = 2 + \sqrt{2}x$

$2 = \sqrt{2}x$

$\frac{2}{\sqrt{2}} = x = \frac{2\sqrt{2}}{2} = \boxed{\sqrt{2}}$

(38)

(3) $\frac{x}{y} = \frac{y}{2x+7}$

$\frac{9}{y} = \frac{y}{2(9)+7}$

$\frac{9}{y} = \frac{y}{25}$

$y = 15$

(1) $\frac{x}{12} = \frac{12}{x+7}$

$144 = x^2 + 7x$

$0 = x^2 + 7x - 144$

$0 = (x-9)(x+16)$

$x = 9$

(2) $\frac{x+7}{z} = \frac{z}{2x+7}$

$\frac{16}{z} = \frac{z}{25}$

$z = 20$

(39)

(1) $\frac{x}{x+2} = \frac{x+2}{2x+1}$

$2x^2 + x = x^2 + 4x + 4$

$x^2 - 3x - 4 = 0$

$(x-4)(x+1) = 0$

$x = 4$

$\frac{x}{y} = \frac{y}{x+1}$

$\frac{4}{y} = \frac{y}{5}$

$y = \sqrt{20} = 2\sqrt{5}$

$\frac{x+1}{z} = \frac{z}{2x+1}$

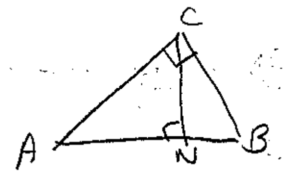
$\frac{5}{z} = \frac{z}{9}$

$z = \sqrt{45} = 3\sqrt{5}$

(40) Given: $\angle ACB$ is rt. $\angle$

CN is altitude of $\triangle ABC$

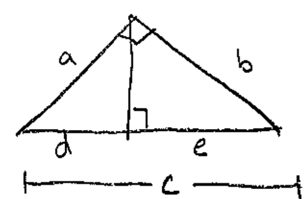
Prove: $\triangle ABC \sim \triangle ACN \sim \triangle CBN$



1. $\angle ACB$ is rt. $\angle$; $\overline{CN}$ is altitude	1. Given
1a. $\overline{CN} \perp \overline{AB}$	1b. def. altitude
2. $\angle CNA$ + $\angle CNB$ rt. $\angle$s	2. def. ~~altitude~~ $\perp$
3. $\angle CNA \cong \angle CNB \cong \angle ACB$	3. all rt. $\angle$s $\cong$
3b. $\triangle ACB$ + $\triangle CNB$ rt. $\triangle$s	3b. def. rt. $\triangle$
4. $\angle B$ + $\angle BCN$ comp. $\angle A$ + $\angle B$ comp.	4. 2 acute $\angle$s of rt. $\triangle$ comp
5. $\angle BCN \cong \angle A$	5. 2 $\angle$s comp. to same $\angle$s $\cong$
6. $\angle A \cong \angle A$	6. Reflexive
7. $\triangle ABC \sim \triangle ACN \sim \triangle CBN$	7. AA $\sim$ Post.

(41) a) $\frac{d}{a} = \frac{a}{c} \rightarrow a^2 = cd$

$\frac{e}{b} = \frac{b}{c} \rightarrow b^2 = ce$



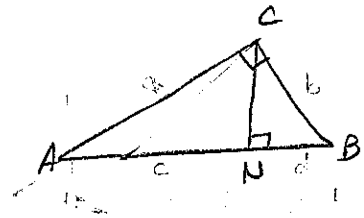
b) $a^2 + b^2 = cd + ce$

$= c(d+e)$

$= c(c)$

$a^2 + b^2 = c^2$

42 Given: $\triangle ABC$ is rt. $\triangle$ w/rt. $\angle C$
$\overline{CN}$ is altitude
Prove: $CN \cdot AB = AC \cdot CB$



1. $\triangle ABC$ is rt. $\triangle$; $\overline{CN}$ is altitude	1. Given
2. $\triangle ABC \sim \triangle ACN$	2. In rt. $\triangle$, if alt. drawn to hyp, $\triangle^s$ formed $\sim$ to original
3. $\frac{AB}{AC} = \frac{CB}{CN}$	3. $\sim \triangle^s \rightarrow$ corr. sides prop.
4. $CN \cdot AB = AC \cdot CB$	4. Means - extremes