7. (b) $\frac{1}{\sqrt{5}-1} \cdot \frac{\sqrt{5}+1}{\sqrt{5}+1}$

$= \frac{\sqrt{5}+1}{4}$

$(\sqrt{5}-1)(\sqrt{5}+1)$

$= 5 + \sqrt{5} - \sqrt{5} - 1$

$= 5 - 1 = 4$

(a) $\frac{1}{2+\sqrt{2}} \cdot \frac{2-\sqrt{2}}{2-\sqrt{2}}$

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

$= 1 - \frac{\sqrt{2}}{2}$

$\frac{1}{4+\sqrt{4}} \cdot \frac{4-\sqrt{4}}{4-\sqrt{4}}$

$\frac{4-\sqrt{4}}{12}$

$(2+\sqrt{2})(2-\sqrt{2})$

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

$= 2$

$(a+b)(a-b)$

$= a^2 - b^2$

$(3\sqrt{2})(4\sqrt{5})$

$= 12\sqrt{10}$

$\sqrt{7} = 2\sqrt{3}\left(\sqrt{12} - 4\right)$

$= \sqrt{7} - 2\sqrt{36} + 8\sqrt{3}$

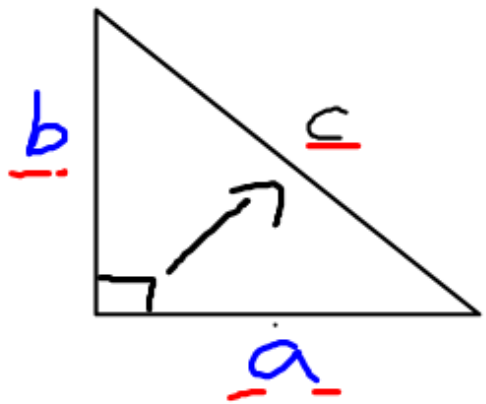
$= \sqrt{7} - 2 \cdot 6 + 8\sqrt{3}$

$= \sqrt{7} - 12 + 8\sqrt{3}$

$2\sqrt{36} = 2 \cdot 6$

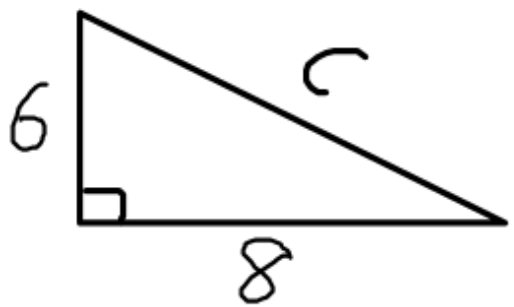
$= 2 \times 6$

# Pythagoras Theorem




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

C is the hypothuse



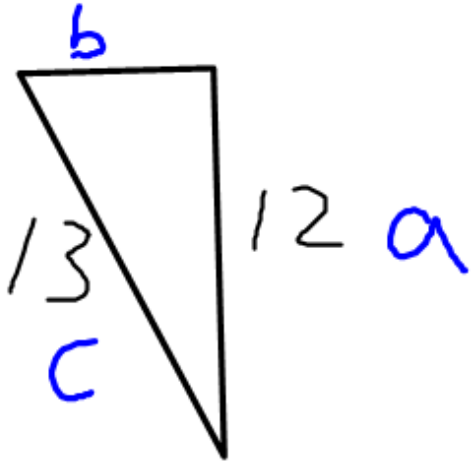

$$a^2 + b^2 = c^2$$

$$6^2 + 8^2 = c^2$$

$$36 + 64 = c^2$$

$$100 = c^2$$

$$10 = c$$




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

$c^2-a^2=b^2$

$13^2-12^2=b^2$

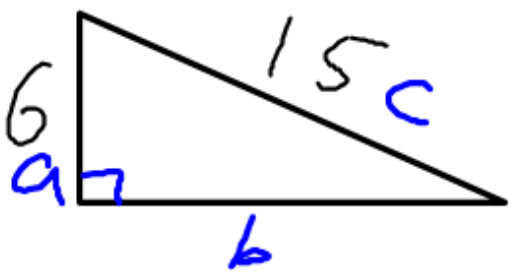
$169-144=25=b^2$

$\sqrt{25}=b$

$5=b$

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

$13^2=12^2+b^2$




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

$$6^2+b^2=15^2$$

$$36+b^2=225$$

$$b^2=189$$

$$b\approx 13.75$$

# Pythagorean Triples

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

| $a$ | $b$ | $c$ |
|---|---|---|
| 3 | 4 | 5 |
| 6 | 8 | 10 |
| 5 | 12 | 13 |
| 10 | 24 | 26 |
| 8 | 15 | 17 |

$12^2 + 5^2 = 13^2$

$144 + 25 = 169$

$100 + 576 = 676$

$64 + 225 = 289$