

Algebra Examples

$$x^2 + 2x = 8$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0$$

$$x = -4, 2$$

$$x^2 + 2x = 8$$

Algebra Examples

$$3(x + 3y = 11)$$

$$-3x - 3y = -15$$

$$2x + 9y = 33$$

$$6y = 18$$

$$y = 3$$

$$x + 3(3) = 11$$

$$\underline{-9 - 9}$$

$$x = 2$$

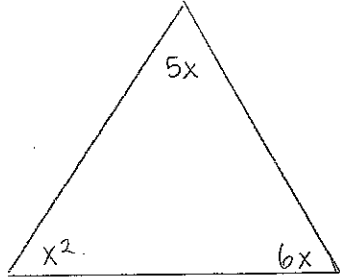
$$\boxed{\begin{matrix} x = 2 \\ y = 3 \end{matrix}}$$

$$x + 3y = 11$$

$$-3x - 3y = -15$$

### Algebra Example

a)



Find the value of  $x$ .

$$x^2 + 6x + 5x = 180$$

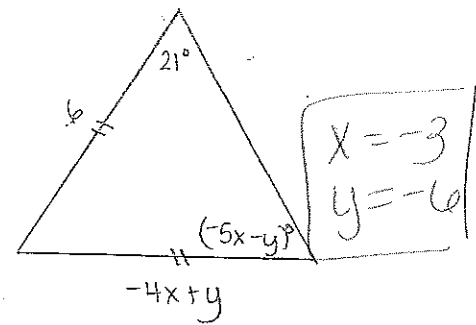
$$x^2 + 11x - 180 = 0$$

$$(x + 20)(x - 9) = 0$$

$x = -20$   
does not work

$$x = 9$$

b)



Find the value of  $x$  &  $y$ .

~~$$(x + 20)(x - 9) = 0$$~~

$$-4x + y = 6$$

$$-5x - y = 21$$

$$-9x = 27$$

$$x = -3$$

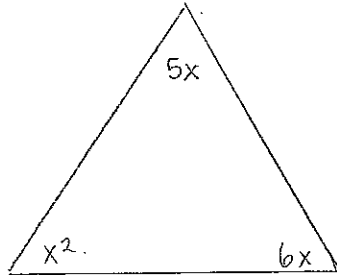
$$-4(-3) + y = 6$$

$$-12$$

$$y = -6$$

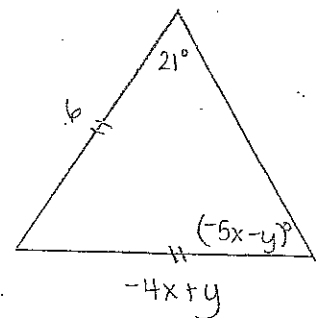
### Algebra Example

a)



Find the value of  $x$ .

b)

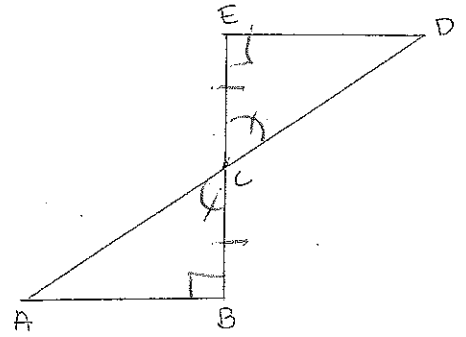


Find the value of  $x$  &  $y$ .

### Basic Proof Example

Given:  $C$  is the midpoint of  $\overline{EB}$   
 $\overline{ED} \perp \overline{EC}$ ;  $\overline{CB} \perp \overline{AB}$

Prove:  $\triangle DEC \cong \triangle ABC$



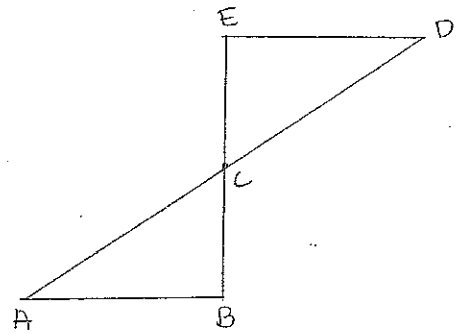
1.  $C$  is the mdpt of  $\overline{EB}$
2.  $\overline{EC} \cong \overline{BC}$
3.  $\overline{ED} \perp \overline{EC}$ ;  $\overline{CB} \perp \overline{AB}$
4.  $\angle E$ ,  $\angle B$  are rt  $\angle$ s
5.  $\angle E \cong \angle B$
6.  $\angle ECD \cong \angle BCA$
7.  $\triangle DEC \cong \triangle ABC$

1. given
2. def mdpt
3. given
4.  $\perp$  lines form rt  $\angle$ s
5. all rt  $\angle$ s  $\cong$
6. V.A.C.T
7. ASA (5, 2, 6)

### Basic Proof Example

Given:  $C$  is the midpoint of  $\overline{EB}$   
 $\overline{ED} \perp \overline{EC}$ ;  $\overline{CB} \perp \overline{AB}$

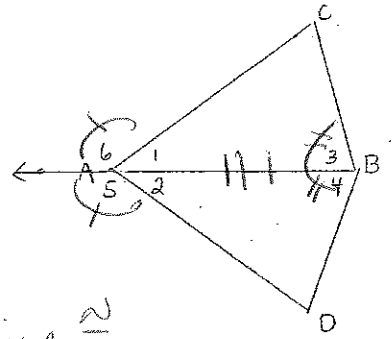
Prove:  $\triangle DEC \cong \triangle ABC$



### CPCTC Example

Given:  $\angle 6 \cong \angle 5$ ,  $\angle 3 \cong \angle 4$

Prove:  $\overline{CB} \cong \overline{BD}$



1.  $\angle 6 \cong \angle 5$ ,  $\angle 3 \cong \angle 4$

2.  $\overline{AB} \cong \overline{AB}$

2 1/2  $m\angle 6 = m\angle 5$

3.  $m\angle 1 + m\angle 6 = 180$

$m\angle 2 + m\angle 5 = 180$

4.  $m\angle 1 + m\angle 6 = m\angle 2 + m\angle 5$

5.  $m\angle 1 + m\angle 5 = m\angle 2 + m\angle 5$

6.  $m\angle 1 = m\angle 2$

7.  $\angle 1 \cong \angle 2$

8.  $\triangle CBA \cong \triangle DBA$

9.  $\overline{CB} \cong \overline{BD}$

1. given

2. reflexive  $\cong$   
prop of  $\cong$

3. Angle Add. Post.

4. Subst =

5. Subst =

6. Subtr. =

7. prop of  $\cong$

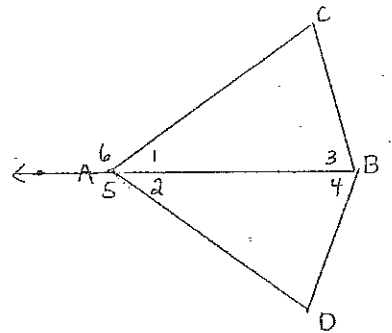
8. ASA (7, 2, 1)

9. CPCTC

### CPCTC Example

Given:  $\angle 6 \cong \angle 5$ ,  $\angle 3 \cong \angle 4$

Prove:  $\overline{CB} \cong \overline{BD}$



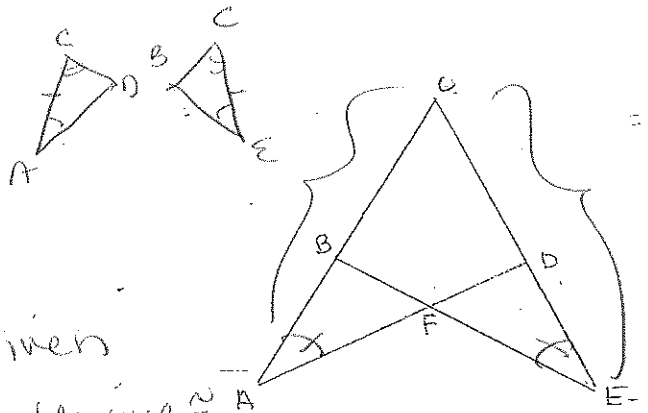
### Overlapping Triangle Example

Given:  $\overline{AC} \cong \overline{CE}$ ,  $\angle A \cong \angle E$

Prove:  $\triangle ACD \cong \triangle ECB$

1.  $\overline{AC} \cong \overline{CE}$ ,  $\angle A \cong \angle E$
2.  $\angle C \cong \angle C$
3.  $\triangle ACD \cong \triangle ECB$

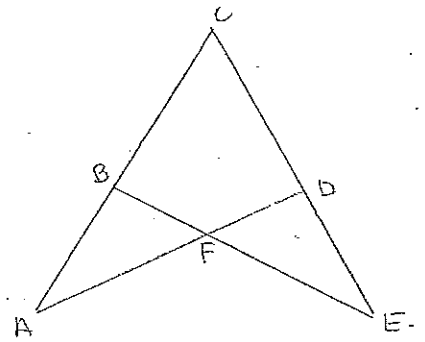
1. given
2. reflexive  $\cong$
3. ASA (1, 1, 2)



### Overlapping Triangle Example

Given:  $\overline{AC} \cong \overline{CE}$ ,  $\angle A \cong \angle E$

Prove:  $\triangle ACD \cong \triangle ECB$

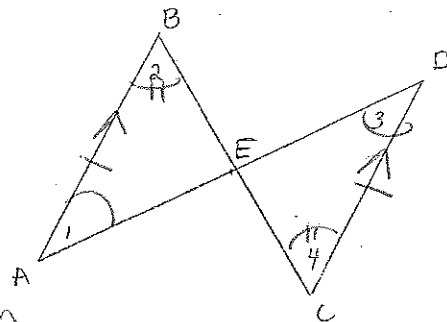


### Extension Example

Given:  $\overline{AB} \parallel \overline{DC}$ ,  $\overline{AB} \cong \overline{DC}$

Prove: E is the midpoint of  $\overline{BC}$

need  $\overline{BE} \cong \overline{CE}$



1.  $\overline{AB} \parallel \overline{DC}$ ,  $\overline{AB} \cong \overline{DC}$
2.  $\angle 2 \cong \angle 4$ ,  $\angle 1 \cong \angle 3$
3.  $\triangle ABE \cong \triangle DCE$
4.  $\overline{BE} \cong \overline{CE}$
5. E is the mdpt of  $\overline{BC}$

1. given
2. alt. int.  $\angle$  Thm
3. ASA (2, 1, 2)
4. CPCTC
5. def. mdpt.

### Extension Example

Given:  $\overline{AB} \parallel \overline{DC}$ ,  $\overline{AB} \cong \overline{DC}$

Prove: E is the midpoint of  $\overline{BC}$

