Name each property being used.

1. $\overline{AB} \cong \overline{AB}$ Reflexive prop.

2. If x = 2 and x = y, then y = 2. subst prop.

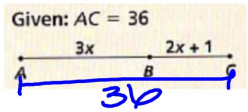
3. If x = 3 and 2x + 7 = 4y, then 2(3) + 7 = 4y. subst prop.

4. If $\angle A \cong \angle B$, then $\angle B \cong \angle A$
Symm.

5. Which of the following is an example of the Reflexive Property of Equality?

- If $x = -2$, then $x + 4 = -2 + 4$.
- $x - 2 = x - 2$
- If $y = x + 4$, then $x + 4 = y$.
- If $x - 2 = y$ and $y = 4$, then $x - 2 = 4$.

6. Fill in the missing information in the proof below.



Statements	Justifications
1. AB + BC = AC	1. Segment Addition.
2. 3x+2x+1 = 36	2. Substitution
3. 5x + 1 = 36	3. Simplify
4. 5x = 35	4. Subtraction Property of Equality
5. x = 7	5. div. prop.

7. Which of the following is equivalent to $\frac{4x^2 + 6x}{4x + 2}$?

A) x

B) $x + 4$

C) $x - \frac{2}{4x + 2}$

D) $x + 1 - \frac{2}{4x + 2}$

$$\begin{array}{r} x + 1 \\ 4x+2 \overline{)\, 4x^2 + 6x} \\ -(4x^2 + 2x) \\ \hline 4x \\ -(4x + 2) \\ \hline 2 \end{array}$$

$$x + 1 - \frac{2}{4x+2}$$

8. $2x^2 - 4x = t$

In the equation above, t is a constant. If the equation has no real solutions, which of the following could be the value of t ?

A) -3

B) -1

C) 1

D) 3

$2x^2 - 4x - t < 0$ $b^2 - 4ac = 0$ 1 sol.

$b^2 - 4ac < 0$ < 0 No real

$2x^2 - 4x - t < 0$ > 0 two.

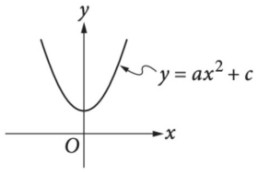
$16 - 4(2)(-t) < 0$

$16 + 8t < 0$

$8t < -16$

$t < -2$

9.



The vertex of the parabola in the xy-plane above is $(0, c)$. Which of the following is true about the parabola with the equation $y = -a(x - b)^2 + c$?

A) The vertex is (b, c) and the graph opens upward.

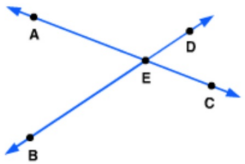
B) The vertex is (b, c) and the graph opens downward.

C) The vertex is $(-b, c)$ and the graph opens upward.

D) The vertex is $(-b, c)$ and the graph opens downward.

1. Use Patty Paper for this activity. Save your Patty Paper to use later in the Student Activity Sheet.

   Draw and label two intersecting lines as in the diagram. Use a protractor to measure the vertical angles. What do you notice about the measures of the vertical angles? **[EX3, page 1]**

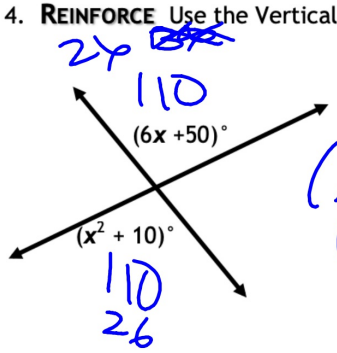


2. Based upon your observations and measurements, write a conjecture stating what you believe to be true about vertical angles. **[EX3, page 3]**

3. On what kind of reasoning is your conjecture based? **[EX3, page 3]**

The conjecture is based on inductive reasoning.

4. **REINFORCE** Use the Vertical Angle Conjecture to solve for ***x***.



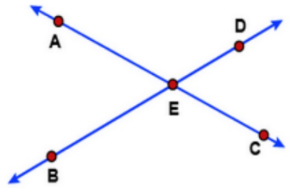
$6x+50 = x^2+10$

$0 = x^2-6x-40$

$(x-10)(x+4)=0$

$x=10 \quad -4$

5. Use transformations to justify the Vertical Angle Conjecture. **[EX3, page 4]**



Given: $\overleftrightarrow{AC}$ and $\overleftrightarrow{BD}$ intersect at point **E**.
Prove: $\angle DEC \cong \angle AEB$

Proof:

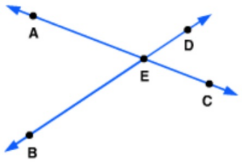
Because $\overleftrightarrow{AC}$ and $\overleftrightarrow{BD}$ are straight lines, rotating $\overrightarrow{ED}$ 180° about point **E** maps the ray to a ray that coincides with $\overrightarrow{EB}$. Rotating $\overrightarrow{EC}$ 180° about point **E** maps the ray to a ray that coincides with ray $\overrightarrow{EA}$. A rotation of 180° about point **E** maps $\angle DEC$ onto $\angle AEB$. Because rotations preserve congruence, $\angle DEC \cong \angle AEB$.

6. Using the answer choices provided, complete the proof. **[EX3, page 5]**

$m\angle DEC + m\angle DEA = 180^\circ$	**Linear Pair Theorem**	$m\angle DEC + m\angle DEA = m\angle AEB + m\angle DEA$
Substitution Property	$m\angle DEC = m\angle AEB$	**Subtraction Property**

Given: Lines $\overleftrightarrow{AC}$ and $\overleftrightarrow{BD}$ intersect at point **E**.

Prove: $m\angle DEC = m\angle AEB$



7. Write the Vertical Angle Theorem. **[EX3, page 6]**

8. Complete the statements to describe the type of reasoning you have used in this Student Activity Sheet. **[EX3, page 7]**

deductive reasoning	**inductive reasoning**

a. Writing the Vertical Angle Conjecture used inductive reasoning.

b. Proving the Vertical Angle Theorem used deductive reasoning.