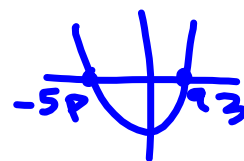


## Bell Ringer

Tuesday 12/18

1. What is factored form? What information is easily found in factored form?

$$y = a(x-p)(x-q)$$



2. If 3 and -5 are zeros of a quadratic function, what are the factors of the same function?

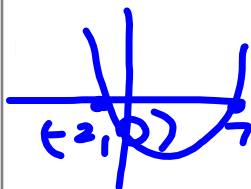
$$x = -5$$

$$(x+5) = 0$$

$$x = 3$$

$$(x-3) = 0$$

3. If -2 and 7 are zeros of a quadratic function, what is the function in STANDARD FORM?



$$(x+2)(x-7)$$

$$x = -2$$

$$x = 7$$

$$y = x^2 - 7x + 2x - 14$$

$$y = x^2 - 5x - 14$$

$$(-2)^2 - 5(-2) - 14 = 0$$

$$4 + 10 - 14 = 0$$

## Correct 6.1B Algebraic Proofs

Name: Key

Section 6.1  
Algebraic Proofs

Solve each equation. Write a reason for every step.

1.  $4x = 12x + 32$

- |   |  |
|---|--|
| ① $4x = 12x + 32$<br>② $-8x = 32$<br>③ $x = -4$ | ① Given<br>② Subtraction prop of =<br>③ Division property of = |
|---|--|

2.  $28 + 12x = 8x - 4$

- |   |   |
|---|---|
| ① $28 + 12x = 8x - 4$<br>② $28 + 4x = -4$<br>③ $4x = -32$<br>④ $x = -8$ | ① Given<br>② Subtraction prop of =<br>③ Subtraction prop of =<br>④ Division prop of = |
|---|---|

3.  $60x + 153 = 9x + 51$

- |   |   |
|---|---|
| ① $60x + 153 = 9x + 51$<br>② $51x + 153 = 51$<br>③ $51x = -102$<br>④ $x = -2$ | ① Given<br>② Subtraction prop of =<br>③ Subtraction prop of =<br>④ Division prop of = |
|---|---|

4.  $-4x + 10 = -5x + 18$

- |   |  |
|---|--|
| ① $-4x + 10 = -5x + 18$<br>② $x + 10 = 18$<br>③ $x = 8$ | ① Given<br>② Addition prop of =<br>③ Subtraction prop of = |
|---|--|

5.  $-3(x + 2) = 16 - x$

- |  |  |
|--|--|
| ① $-3(x + 2) = 16 - x$<br>② $-3x - 6 = 16 - x$<br>③ $-6 = 16 + 2x$<br>④ $-22 = 2x$<br>⑤ $-11 = x$<br>⑥ $x = -11$ | ① Given<br>② Distributive property<br>③ Addition prop of =<br>④ Subtraction prop of =<br>⑤ Division prop of =<br>⑥ Symmetric prop of = |
|--|--|

6.  $-x - 2(9 - 8x) = 12$

- |   |   |
|---|---|
| ① $-x - 2(9 - 8x) = 12$<br>② $-x - 18 + 16x = 12$<br>③ $15x - 18 = 12$<br>④ $15x = 30$<br>⑤ $x = 2$ | ① Given<br>② Distributive property<br>③ Substitution property<br>④ Addition prop of =<br>⑤ Division prop of = |
|---|---|

7.  $6(x - 6) = x(16 - 7)$

- |   |  |
|---|--|
| ① $6(x - 6) = x(16 - 7)$<br>② $6x - 36 = 16x - 7x$<br>③ $6x - 36 = 9x$<br>④ $-36 = 3x$<br>⑤ $-12 = x$ | ① Given<br>② Distributive property<br>③ Substitution property<br>④ Subtraction prop of =<br>⑤ Division prop of = |
|---|--|

8.  $\frac{1}{4}x + 10 = 2$

- |   |  |
|---|--|
| ① $\frac{1}{4}x + 10 = 2$<br>② $\frac{1}{4}x = -8$<br>③ $x = -32$ | ① Given<br>② Subtraction prop of =<br>③ Multiplication prop of = |
|---|--|

9.  $2(4-x)+1=16-3x$

① $2(4-x)+1=16-3x$	① Given
② $8-2x+1=16-3x$	② Distributive Property
③ $9-2x=16-3x$	③ Substitution Prop of =
④ $9+x=16$	④ Addition prop of =
⑤ $x=7$	⑤ Subtraction prop of =

10.  $\frac{1}{3}x+4=6x+12$

① $\frac{1}{3}x+4=6x+12$	① Given
② $\frac{1}{3}x=6x+8$	② Subtraction prop of =
③ $-\frac{17}{3}x=8$	③ Subtraction prop of =
④ $x=\frac{-24}{17}$	④ multiplication prop of =

11. Given:  $8x - 5 = 2x + 1$   
Prove:  $x = 1$

Proof:

Statements	Reasons
a. $8x - 5 = 2x + 1$	a. <u>Given</u>
b. $8x - 5 - 2x = 2x + 1 - 2x$	b. <u>Subtraction prop of =</u>
c. $6x - 5 = 1$	c. Substitution Property
d. $6x - 5 + 5 = 1 + 5$	d. Addition Property
e. $6x = 6$	e. <u>Substitution property</u>
f. $\frac{6x}{6} = \frac{6}{6}$	f. <u>Division Property of =</u>
g. $x = 1$	g. <u>Substitution property</u>

12.

Given:  $\frac{4x+6}{2} = 9$

Prove:  $x = \frac{2}{3}$

Proof:

Statements	Reasons
a. $\frac{4x+6}{2} = 9$	a. <u>Given</u>
b. $2\left(\frac{4x+6}{2}\right) = 2(9)$	b. Mult. Prop.
c. $4x + 6 = 18$	c. <u>Substitution</u>
d. $4x + 6 - 6 = 18 - 6$	d. <u>Subtraction</u>
e. $4x = 12$	e. Substitution
f. $\frac{4x}{4} = \frac{12}{4}$	f. Div. Prop.
g. $x = 3$	g. Substitution

13.

Given:  $4x + 8 = x + 2$

Prove:  $x = -2$

Proof:

Statements	Reasons
a. $4x + 8 = x + 2$	a. <u>Given</u>
b. $4x + 8 - x = x + 2 - x$	b. <u>Subtraction</u>
c. $3x + 8 = 2$	c. Substitution
d. $3x + 8 - 8 = 2 - 8$	d. Subtr. Prop.
e. $3x = -6$	e. Substitution
f. $\frac{3x}{3} = \frac{-6}{3}$	f. <u>Division</u>
g. $x = -2$	g. Substitution

6.1C Due tomorrow :)

Questions??

Name: \_\_\_\_\_ Hr: \_\_\_\_\_ 6.1 C Algebraic and Linear Proofs

Standard: Students will be able to prove algebraic calculations

1. Order the statements correctly. Then choose the reasons for each statement from the choices below.

Given:  $2x + 3 = 5x - 6$

Prove:  $x = 3$

Statements:	Reasons (Justification):
1)	a)
2)	b)
3)	c)
4)	d)
5)	e)

<p>Statements:</p> <ul style="list-style-type: none"> <li>• <math>3 = x</math></li> <li>• <math>2x + 3 = 5x - 6</math></li> <li>• <math>9 = 3x</math></li> <li>• <math>x = 3</math></li> <li>• <math>3 = 3x - 6</math></li> </ul>	<p>Reasons:</p> <ul style="list-style-type: none"> <li>• Subtraction Property of Equality</li> <li>• Given</li> <li>• Addition Property of Equality</li> <li>• Subtraction Property of Equality</li> <li>• Division Property of Equality</li> <li>• Substitution Property</li> <li>• Symmetric Property</li> <li>• Reflexive Property</li> </ul>
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2. Write a complete proof.

Given:  $3x - 5 = 10$

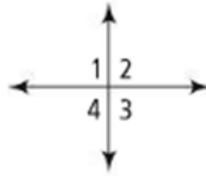
Prove:  $x = 5$

Statements:	Reasons (Justification):

(Hint: Work out the problem first, use the steps as statements)

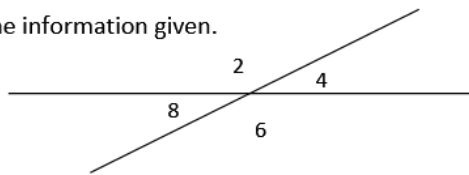
Standard: Students will be able to prove statements about angles.

3. Fill in the blanks on the following proof.  
 Given:  $\angle 1 \cong \angle 2$   
 Prove:  $\angle 4 \cong \angle 3$



Statements:	Reasons:
1) $\angle 1 \cong \angle 2$	a) _____
2) $\angle 4 \cong \angle 2$	b) Vertical angles are $\cong$
3) _____	c) Transitive Property of Congruence
4) $\angle 1 \cong \angle 3$	d) _____
5) $\angle 4 \cong \angle 3$	e) _____

4. Write a complete proof using the information given.  
 Given:  $\angle 2 \cong 140^\circ$   
 Prove:  $\angle 8 \cong 40^\circ$



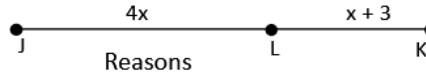
Statements:	Reasons:

Standard: Students will be able to prove statements about lines (segments)

5. Complete the proof by filling in the spaces below.

Given:  $JK = 48$

Prove:  $x = 9$



Statements	Reasons
1)	a) Given
2) $JL + LK = JK$	b)
3)	c) Substitution Property
4) $5x + 3 = 48$	d) Distributive Property
5)	e)
6) $x = 9$	f)

6. Use the statements and reasons given at the bottom to write a complete proof of the following:

Given:  $C$  is the midpoint of  $\overline{AD}$ .

Prove:  $x = 4$



Statements:

Reasons:

<p>Statements:</p> <ul style="list-style-type: none"> <li>• <math>2x = 12</math></li> <li>• <math>m\overline{AC} = m\overline{CD}</math></li> <li>• <math>5x = 3x + 8</math></li> <li>• <math>\overline{AC} \cong \overline{CD}</math></li> <li>• <math>x = 4</math></li> <li>• <math>C</math> is the midpoint of <math>\overline{AD}</math></li> </ul>	<p>Reasons:</p> <ul style="list-style-type: none"> <li>• Congruent segments have equal length</li> <li>• Subtraction Property of Equality</li> <li>• Given</li> <li>• Definition of midpoint</li> <li>• Division Property of Equality</li> <li>• Substitution Property</li> </ul>
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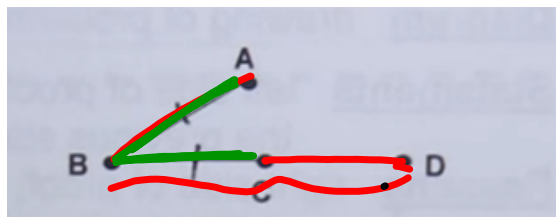
When creating proofs remember:

**Never write  
statements  
based upon  
appearances.**

**Write statements  
based only on  
known facts.**

Try thinking it through in your head or explaining it to someone before writing anything down...

GIVEN:  $\overline{AB} = \overline{BC}$   
 PROVE:  $AB + CD = BD$



Statements:

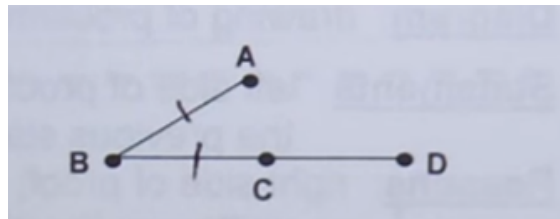
Reasons:

$\overline{AB} = \overline{BC}$   
 $\overline{BC} + \overline{CD} = \overline{BD}$   
 $\overline{AB} + \overline{CD} = \overline{BD}$

Given  
 Segment Addition Post.  
 Substitution

**GIVEN:**  $AB = BC$

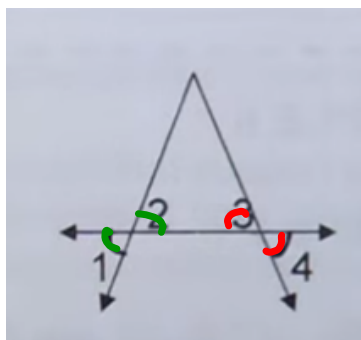
**PROVE:**  $AB + CD = BD$



STATEMENTS	REASONS
$AB = BC$	Given
$BC + CD = BD$	Segment Addition Postulate
$AB + CD = BD$	Substitution Prop.

GIVEN:  $\angle 1 \cong \angle 4$

PROVE:  $\angle 2 \cong \angle 3$



Statements:

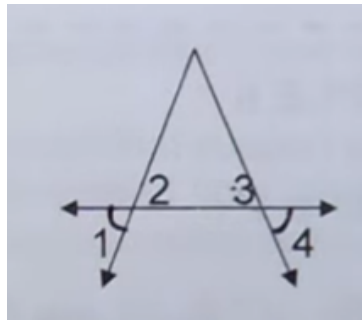
Reasons:

$\angle 1 \cong \angle 4$   
 $\angle 1 \cong \angle 2$   
 $\angle 4 \cong \angle 3$   
 $\angle 2 \cong \angle 3$

Given  
 Vertical  $\angle$ 's are  $\cong$   
 Vertical  $\angle$ 's are  $\cong$   
 Substitution

**GIVEN:**  $\angle 1 \cong \angle 4$

**PROVE:**  $\angle 2 \cong \angle 3$

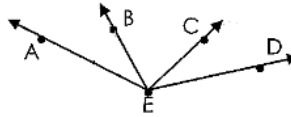


STATEMENTS	REASONS
$\angle 1 \cong \angle 4$	Given
$\angle 1 \cong \angle 2$	Vertical $\angle$ s Th.
$\angle 3 \cong \angle 4$	Vertical $\angle$ s Th.
$\angle 2 \cong \angle 3$	Substitution Prop.

6.2A Line Segment and Angle Proofs

Name: \_\_\_\_\_ Hr: \_\_\_\_\_

1. Given:  $\angle AEC \cong \angle DEB$   
 Prove:  $\angle AEB \cong \angle DEC$



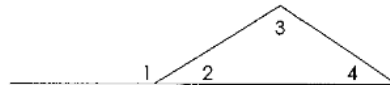
Statements	Reasons
1. $\angle AEC \cong \angle DEB$	1. Given
2. $m\angle AEC = m\angle DEB$	2. Definition of $\cong$ angles
3. $m\angle AEB + m\angle BEC = m\angle AEC$	3. Angle Addition Postulate
4. $m\angle DEC + m\angle BEC = m\angle DEB$	4. Angle Addition Postulate
5. $m\angle AEB + m\angle BEC = m\angle DEC + m\angle BEC$	5. Substitution
6. $m\angle AEB = m\angle DEC$	6. Subtraction P.A.E.
7. $\angle AEB \cong \angle DEC$	7. Definition of $\cong$ $\angle$ s

2. Given:  $\overline{BC} \cong \overline{DE}$   
 Prove:  $AC = AB + DE$



Statements	Reasons
1. $\overline{BC} \cong \overline{DE}$	1. Given
2. $BC = DE$	2. Definition of $\cong$ segments
3. $AC = AB + BC$	3. Segment Addition Postulate
4. $AC = AB + DE$	4. Substitution

3. Given:  $\angle 1$  and  $\angle 2$  form a linear pair;  
 $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$   
 Prove:  $m\angle 1 = m\angle 3 + m\angle 4$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ form a linear pair	1.
2. $\angle 1$ and $\angle 2$ are supplementary	2.
3. $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$	3.
4. $m\angle 1 + m\angle 2 = 180^\circ$	4.
5. $m\angle 2 = m\angle 2$	5.
6. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 + m\angle 4$	6.
7. $m\angle 1 = m\angle 3 + m\angle 4$	7.

4. Given: B is between A and D; C is between A and D  
 Prove:  $AB + BD = AC + CD$

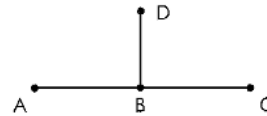


Statements	Reasons
1. B is between A and D; C is between A and D	1.
2. $AB + BD = AD$	2.
3. $AC + CD = AD$	3.
4. $AD = AC + CD$	4.
5. $AB + BD = AC + CD$	5.

5. Given:  $3x - 2 = x - 8$   
 Prove:  $x = -3$

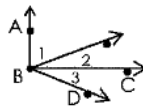
Statements	Reasons
1. $3x - 2 = x - 8$	1.
2. $3x - 2 + 2 = x - 8 + 2$	2.
3. $3x + 0 = x - 6$	3.
4. $3x + (-x) = x + (-x) - 6$	4.
5. $2x = -6$	5.
6. $x = -3$	6.

6. Given:  $A, B,$  and  $C$  are collinear;  $AB = BD$ ;  $BD = BC$   
 Prove:  $B$  is the midpoint of  $\overline{AC}$



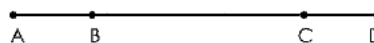
Statements	Reasons
1.	1. Given
2.	2. Transitive Property of Equality
3.	3. Definition of Congruent Segments
4.	4. Definition of Midpoint

7. Given:  $\overline{AB} \perp \overline{BC}$ ;  $m\angle 2 = m\angle 3$   
 Prove:  $m\angle 1 + m\angle 3 = 90^\circ$



Statements	Reasons
1. $\overline{AB} \perp \overline{BC}$ ; $m\angle 2 = m\angle 3$	1.
2.	2.
3.	3.
4.	4.
5.	5.
6. $m\angle 1 + m\angle 3 = 90^\circ$	6.

8. Given:  $AD = 2AB + BC$   
 Prove:  $\overline{AB} \cong \overline{CD}$



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

