Name_____

Write your questions here!

A_____, is a convincing argument that uses deductive reasoning. Every statement you make must be justified with a valid property. The following properties will be super valuable:

Property	Example
	If you are given: $x - 5 = 12$ Then you can conclude:
	If you are given: $x + 6 = 15$ Then you can conclude:
	If you are given: $\frac{1}{5}x = -2$ Then you can conclude:
	If you are given: $2x = 8$ Then you can conclude:
	If you are given: $y = 2x + 2$ and $x = 5$ Then you can conclude:
Other Important Properties	
	If you are given: 30 Then you can conclude:
	If you are given: $5 = x$ Then you can conclude:
	If you are given: $y = j$ and $j = -13$ Then you can conclude:
	If you are given: $12 = 3(x - 9)$ Then you can conclude:
	If you are given: $y = 3(4) - 12$ Then you can conclude:
	If you are given: $100 = 45x - 20x$ Then you can conclude:
The Algemazing-Postulate*	Always conclude: $Coolness_{(Algebros)} > \sum Coolness_{(World)}$

* The last postulate has yet to be proven, but the teachers of this course are pretty sure it's true based on how highly we think of ourselves. We are currently refusing outside input regarding this postulate.

Write your questions here!

PACKET 2.2: INTRO TO PROOFS

Examples: **Tell which property justifies each conclusion.**

1. Given: $6x + 2 = 12$

Conclusion: $6x = 10$

2. Given: $45 = x$

Conclusion: $x = 45$

3. Given: $3x - 7x = 20$

Conclusion: $-4x = 20°$

4. Given: $4(q - x) = r$

Conclusion: $4q - 4x = r$

5. If $a = r$ and $r = 60°$, then $a = 60°$.

6. If B is the midpoint of $\overline{GH}$, then..._____
(???)

2 Column Proofs

A two-column proof lists each statement on the left with a justification on the right. Each step follows logically from the line before it.

Fill in the missing statements or reasons for the following two-column proof.

Example #1

Given: $45 + 2(x - 10) = 85$
Prove: $x = 30$

← This line tells you everything that has been _____, or everything that is known to be true.

← This line tells you what you must _____.

Statement	Reason
1. $45 + 2(x - 10) = 85$	1.
2. $2(x - 10) = 40$	2.
3. $2x - 20 = 40$	3.
4. $2x = 60$	4.
5. $x = 30$	5.

Example #2

Given: $4x - 2(2 - x) = 4x - 24$
Prove: $x = -10$

Statement	Reason
1.	1.
2. $-2(2 - x) = -24$	2.
3. $2 - x = 12$	3.
4. $-x = 10$	4.
5	5.

Write your questions here!

Example #3

Given: $3x + 4y = 23; x = 1$
Prove: $y = 5$

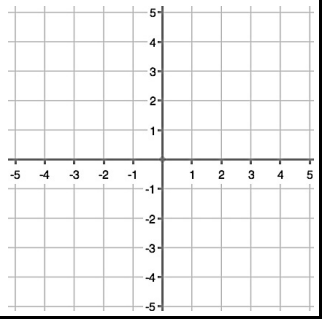
Statement	Reason
1.	1.
2. $3(1) + 4y = 23$	2.
3. $3 + 4y = 23$	3.
4. $4y = 20$	4.
5	5.

Now, summarize your notes here!

Solve each equation for x!		Multiply!	Factor!
1. $10x - 3 = 12$	2. $2x + -4 = 3x - 4$	3. $x(x - 3)$	4. $2x^2 - 32x$

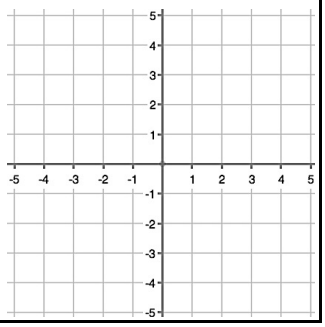
5. Graph the equation:

$y = -x$



6. Graph the equation:

$y = -2$



Practice 2.2: Introduction To Proofs

Support each conclusion with a valid reason.

1. Given: $x - 42 = 12$

Conclusion: $x = 54$

2. Given: $23(2 + x) = 230$

Conclusion: $2 + x = 10$

3. Given: $3x - 7x = 20$

Conclusion: $-4x = 20°$

4. Given: $-x = 34$

Conclusion: $x = -34$

5. If $12 = d$ and $d = x$, then $12 = x$.

6. $\overline{GH} \cong \overline{GH}$

Fill in the missing statements or reasons for the following two-column proof.

Given: $4x - 20 = 100$ Prove: $x = 30$

Proof #1

Statement	Reason
1. $4x - 20 = 100$	1.
2. $4x = 120$	2.
3. $x = 30$	3.

Given: $12 - x = 10$ Prove: $x = 2$

Proof #2

Statement	Reason
1.	1.
2. $-x = -2$	2.
3. $x = 2$	3.

Given: $5x + 20 = 20 + -2x$ Prove: $x = 0$

Proof #3

Statement	Reason
1.	1.
2. $5x = -2x$	2.
3. $5x = 0$	3.
4.	4.

Given: $12 - x = 10$ Prove: $x = 2$

Proof #4

Statement	Reason
1.	1.
2. $12 = 10 + x$	2.
3. $2 = x$	3.
4.	4.

Given: $10 - 3(4x - 2) + 1 = 77$ Prove: $x = -5$

Statement	Reason
1.	1.
2. $- 3(4x - 2) + 1 = 67$	2.
3. $- 3(4x - 2) = 66$	3.
4. $-12x + 6 = 66$	4.
5. $-12x = 60$	5.
6.	6.

Application 2.2: Introduction To Proofs

Support each conclusion with a valid reason.

1. Given: $34x = 68$
Conclusion: $x = 2$

2. Given: $x = 3.14$
Conclusion: $3.14 = x$

3. Given: $3(x - 2) = 21$
Conclusion: $3x - 6 = 21$

Geometry Properties. Draw a picture to represent each situation and then tell <u>WHY</u> each conclusion can be made:

4. Given: $\overrightarrow{AB}$ *is the bisector of* $\measuredangle DAC$
Conclusion: $\measuredangle DAB \cong \measuredangle CAB$
Picture:

Reason:_____

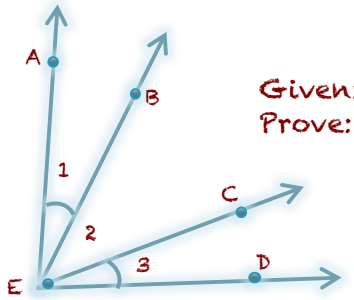
5. H is the midpoint of $\overline{QR}$
Conclusion: $\overline{QH} \cong \overline{HR}$
Picture:

Reason:_____

6. Given: Point B is on $\overline{AC}$
Conclusion: AB + BC = AC
Picture:

Reason:_____

Write the reasons for the proofs below:



Given: $m\measuredangle 1 = m\measuredangle 3$
Prove: $m\measuredangle AEC = m\measuredangle DEB$

Statement	Reason
1. $m\measuredangle 1 = m\measuredangle 3$	1.
2. $m\measuredangle 2 = m\measuredangle 2$	2.
3. $m\measuredangle 1 + m\measuredangle 2 = m\measuredangle 3 + m\measuredangle 2$	3.
4. $m\measuredangle 1 + m\measuredangle 2 = m\measuredangle AEC$	4.
5. $m\measuredangle 3 + m\measuredangle 2 = m\measuredangle DEB$	5.
6. $m\measuredangle AEC = m\measuredangle DEB$	6.