# Pre-Proof Study Guide

2.5 Objective: Use algebraic properties in logical arguments.

1. Solve 2x + 5 = 20 - 3x. Write a reason for each step.

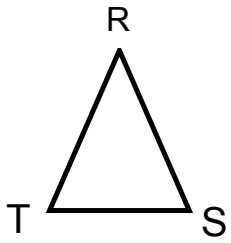
| | |
|---|---|
| $2x+5=20-3x$ | given |
| $2x=15-3x$ | sub prop of = |
| $5x=15$ | add prop of = |
| $x=3$ | divide prop of = |

2.6 Objective: Write proofs using geometric theorems.

2. Complete the proof

Given: RT = 5 RS = 5 $\overline{RT} \cong \overline{TS}$

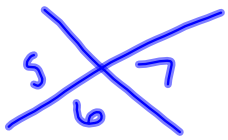
Prove: $\overline{RS} \cong \overline{TS}$




| | |
|---|---|
| 1. $RT=5, RS=5, \overline{RT}\cong\overline{TS}$ | 1. Given |
| 2. RS = RT | 2. Transitive P.O.E. |
| 3. RT = TS | 3. Definition of congruent segments |
| 4. RS = TS | 4. Transitive P.O.E. |
| 5. $\overline{RS}\cong\overline{TS}$ | 5. Definition of congruent segments |

2.7 Objective: Use properties of special pairs of angles.

3. Complete the proof:




Given: <5 and <7 are vertical angles

Prove: <5 ≅ <7

| | |
|---|---|
| 1. ∠5 & ∠7 are Vt. ∠'s | 1. Given |
| 2. <5 and <6 are a linear pair<br><6 and <7 are a linear pair | 2. Definition of a linear pair |
| 3. <5 and <6 are supplementary<br><6 and <7 are supplementary | 3. Def of supp. ∠'s<br>linear pair postulate |
| 4. ∠5 ≅ ∠7 | 4. Congruent Supplements Theorem |

Problem 4 Find the measure of x

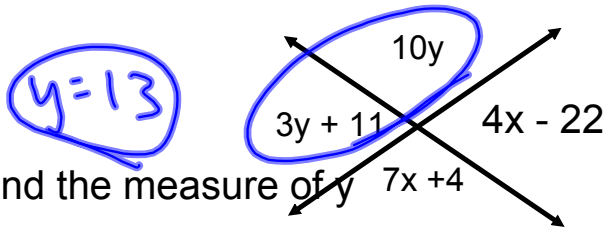
$4x - 22 + 7x + 4 = 180$

$11x - 18 = 180$

$+18 \quad +18$

$\frac{11x}{11} = \frac{198}{11}$

$x = 18$




y = 13

5. Find the measure of y

6. Find the measure of a

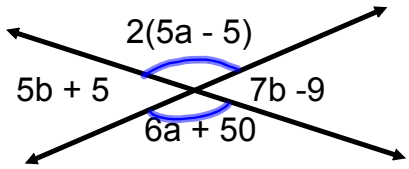
$2(5a - 5) = 6a + 50$

$10a - 10 = 6a + 50$

$-6a \quad +10 \quad -6a \quad +10$

$4a = 60$

$a = 15$




7. Find the measure of b

b = 7

3.1 Objective: Identify angle pairs formed by three intersecting lines.

Classify the angle pairs as corresponding, alternate interior, alternate exterior, consecutive interior, vertical or linear pair.

8. < 1 and <4 vert ∠s

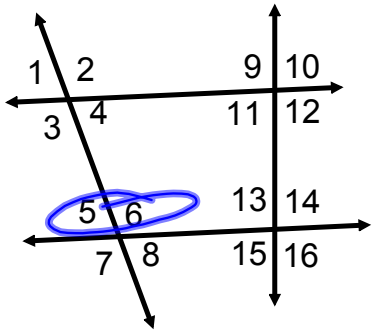
9. <6 and <13 cons. int.

10. <2 and <11 alt. int.

11. <8 and <4 corres.

12. <10 and <15 alt ext

13. <5 and <6 linear pair




3.2 Objective: Use angles formed by parallel lines and transversals.

14. If two parallel lines are cut by a transversal then the pairs of alternate exterior angles are congruent. Use the steps below to write a proof of the alternate exterior angles theorem.

Given: p II q

Prove: <1 ≅ <2

Steps to help you:

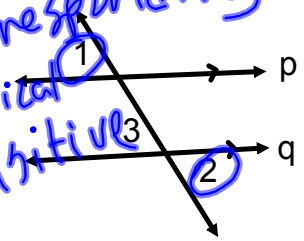
Show < 1 ≅ <3

Then show <1 ≅ <2

∠1 ≅ ∠3 corresponding

∠3 ≅ ∠2 vertical

∠1 ≅ ∠2 transitive



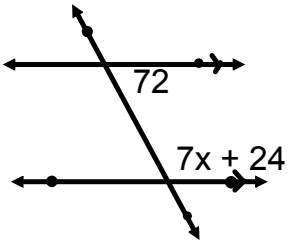
If 2 parallel lines are cut by a transversal, then the pairs of consecutive interior angles are supplementary.

15. What Given statement would you need in order to prove this theorem? 2 || lines cut by transversal

16. What would be the prove statement of your proof?

pair of consecutive int. ∠'s = 180

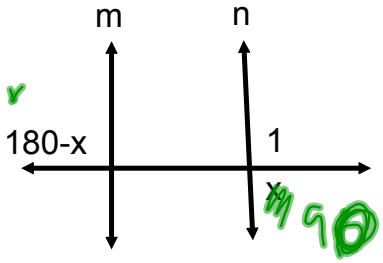
17. Find the value of x




72 + 7x + 24 = 180
7x + 96 = 180
7x = 84
x = 12

3.3 Objective: Use angle relationships to prove that lines are parallel.

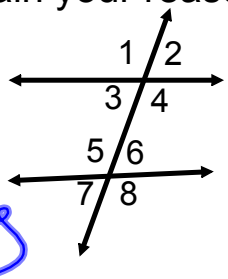
18. Find the value of x that makes m II n




180 - x = x
180 = 2x
x = 90

19. Find the m<1 = 90

20. What angles are congruent to < 3. Explain your reasoning.

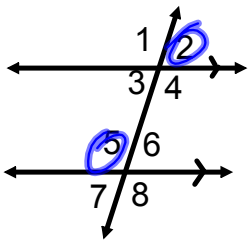



∠2 vert
∠6 alt int
∠7 corresponding

21. Given that line x is parallel to line y, explain the relationship between:

a. <2 and <7 alt ext

b. < 2 and <5 supplementary



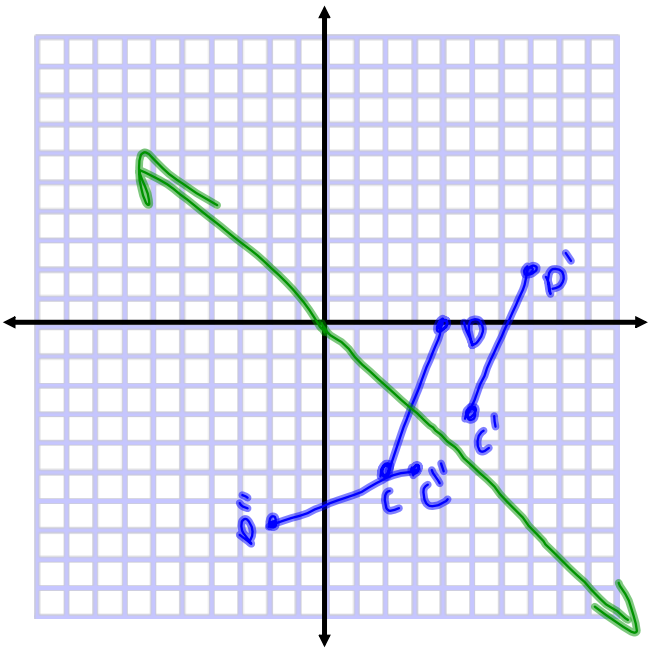

Constructions:

22. Construct an angle and then copy that angle using a compass

23. Construct a segment then bisect the segment

24. Construct a segment then using a compass construct a line parallel to the first one.

25. Graph the segment C(2,-5) and D(4,0) translate it (x,y)→(x + 2,y + 3) Then reflect your new segment over y = -x




$(x,y) \rightarrow (x+2, y+3)$