Name: Key

Date: _____

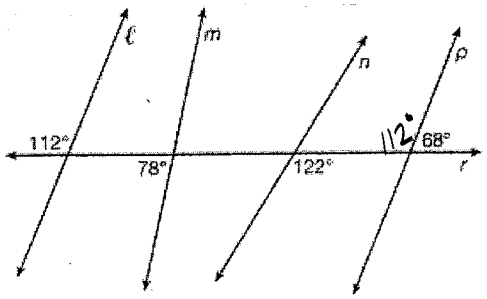
Math 423—Pulford

Quarter 2 Test 2 Review

ile this is a great resource, you need to study your notes, classwork, past assessments, and homework assignments .. prepare for the upcoming exam in addition to completing this review sheet.

1.

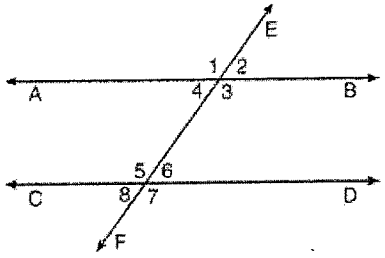
In the diagram below, lines ℓ, m, n, and p intersect line r.



Which statement is true?

1) $\ell \parallel n$
2) $\ell \parallel p$
3) $m \parallel p$
4) $m \parallel n$

Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.



Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?

1) $\angle 2 \cong \angle 4$
2) $\angle 7 \cong \angle 8$
3) $\angle 3$ and $\angle 6$ are supplementary
4) $\angle 1$ and $\angle 5$ are supplementary

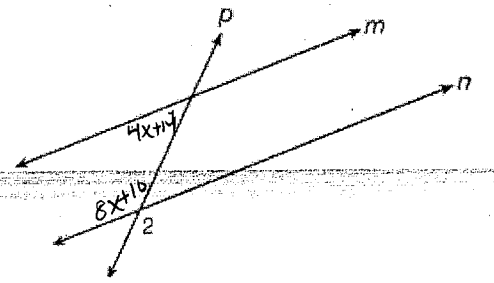
3.

A transversal intersects two lines. Which condition would always make the two lines parallel?

1) Vertical angles are congruent.
2) Alternate interior angles are congruent.
3) Corresponding angles are supplementary.
4) Same-side interior angles are complementary.

4.

As shown in the diagram below, lines m and n are cut by transversal p.



If $m\angle 1 = 4x + 14$ and $m\angle 2 = 8x + 10$, lines m and n are parallel when x equals

1) 1
2) 6
3) 13
4) 17

$4x+14+8x+10 = 180$

$12x+24 = 180$

$\frac{12x}{12} = \frac{156}{12}$ $x=13$

5.

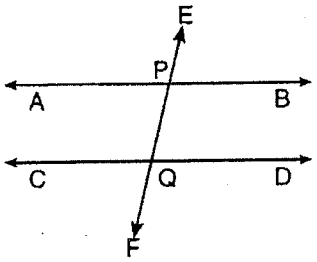
In the diagram below of $\overline{ABCD}$, $\overline{AC} \cong \overline{BD}$.

Using this information, it could be proven that

1) $BC = AB$
2) $AB = CD$
3) $AD - BC = CD$
4) $AB + CD = AD$

6.

In the accompanying diagram, parallel lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are cut by transversal $\overleftrightarrow{EF}$ at P and Q, respectively.



Which statement must always be true?

(1) $m\angle APE = m\angle CQF$
(2) $m\angle APE < m\angle CQF$
(3) $m\angle APE + m\angle CQF = 90$
(4) $m\angle APE + m\angle CQF = 180$

7.

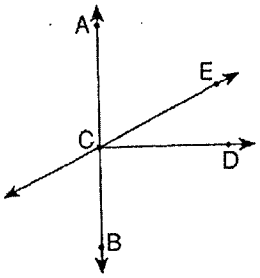
In the diagram of $\overline{WXYZ}$ below, $\overline{WY} \cong \overline{XZ}$.

Which reasons can be used to prove $\overline{WX} \cong \overline{YZ}$?

1) reflexive property and addition postulate
2) reflexive property and subtraction postulate
3) transitive property and addition postulate
4) transitive property and subtraction postulate

8.

In the accompanying diagram, AB intersects $\overleftrightarrow{CE}$ and $\overrightarrow{CD} \perp \overleftrightarrow{AB}$.



Which statement is true?

(1) $\angle ACE \cong \angle BCD$.
(2) B, C, and D are collinear.
(3) $\angle ACE$ and $\angle ECD$ are complementary.
(4) $\angle ACE$ and $\angle ECD$ are supplementary.

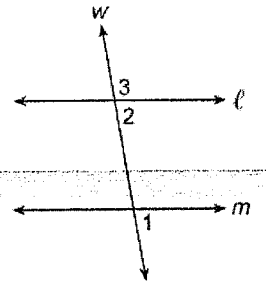
9.

When writing a geometric proof, which angle relationship could be used alone to justify that two angles are congruent?

1) supplementary angles
2) linear pair of angles
3) adjacent angles
4) vertical angles

10.

In the diagram below, line ℓ is parallel to line m, and line w is a transversal.



(Not drawn to scale)

$3x+17+5x-21=180$

$8x-4=180$

$8x=184$

$x=23$

If $m\angle 2 = 3x + 17$ and $m\angle 3 = 5x - 21$, what is $m\angle 1$?

(1) 19 (3) 74

(2) 23 (4) 86

11. Which of the following justifies the statement? "If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$."

(1) Transitive Property (3) Symmetric Property

(2) Subtraction Postulate (4) Reflexive Property

12. Which of the following justifies the statement? "If $\angle A \cong \angle B$, then $\angle B \cong \angle A$."

(1) Transitive Property (3) Symmetric Property

(2) Subtraction Postulate (4) Reflexive Property

13. "If $m\angle A + m\angle B = 180$ and $m\angle C + m\angle D = 180$, then $m\angle A + m\angle B = m\angle C + m\angle D$." This is an example of which postulate?

(1) Substitution
(2) Addition
(3) Subtraction
(4) Angle Addition Axiom

14. "If AB = CD and JK = FG then AB + JK = CD + FG." This is an example of which postulate?

(1) Substitution
(2) Addition
(3) Subtraction
(4) Segment Addition Axiom

15. Any quantity is equal to itself. What postulate is this?

(1) Transitive Postulate (3) Symmetric Postulate

(2) Roots Postulate (4) Reflexive Postulate

16. True or False

a) Two rays with a common endpoint form a line. F

b) Two points determine a plane. F

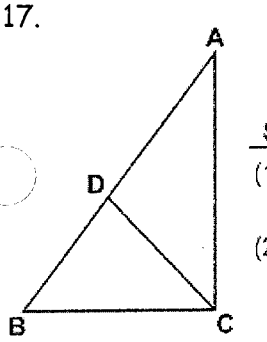
c) If two angles are supplementary then they form a linear pair. F

d) If vertical angles are congruent, then the lines are parallel. F

e) If lines are parallel then same-side interior angles are congruent. F

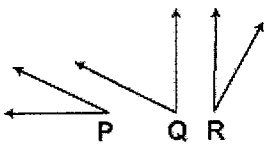
Fill in each of the missing reasons in the below proofs:

17.



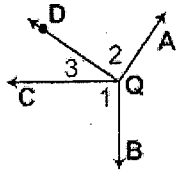
STATEMENTS	REASONS
(1) AD = DC DC = DB	(1) Given
(2) AD = DB	(2) Substitution (1)

18.



STATEMENTS	REASONS
(1) ∠P and ∠Q are complementary. ∠R and ∠Q are complementary.	(1) Given
(2) ∠P ≅ ∠R	(2) Complements of the same angle are ≅.

19.



Given: $\overrightarrow{QA} \perp \overrightarrow{QD}$, $\overrightarrow{QB} \perp \overrightarrow{QC}$

Prove: ∠1 ≅ ∠2

STATEMENTS	REASONS
(1) $\overrightarrow{QA} \perp \overrightarrow{QD}$, $\overrightarrow{QB} \perp \overrightarrow{QC}$	(1) Given
(2) ∠1 and ∠2 are right angles.	(2) Def of ⊥: If lines are ⊥ then they intersect to form right angles.
(3) ∠1 ≅ ∠2	(3) Right angles are ≅

State the postulate that can be used to show that each conclusion is valid.

20) CD = CD

Reflexive

21) 2 + 3 = 5 and 1 + 4 = 5. Therefore, 2 + 3 = 1 + 4.

Substitution

22) 10 = a + 7. Therefore a + 7 = 10.

Symmetric

23) $m\angle A = 30$ and $m\angle B = 30$. Therefore, $m\angle A + m\angle B = 60$.

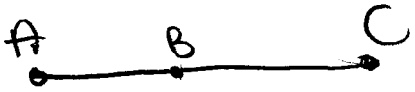
Addition

24) $m\angle A + m\angle B = 180$ and $m\angle A = m\angle C$.

Therefore $m\angle C + m\angle B = 180$.

Substitution

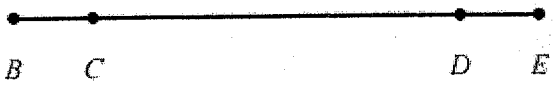
25) AB + BC = AC



Segment addition axiom: A whole is equal to sum of its parts

26.

Write a two-column proof of the following.
Given: $BC = DE$
Prove: $BD = CE$



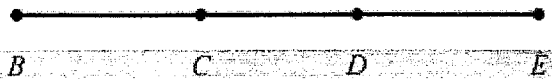
Statements	Reasons
1) BC = DE	1) Given
2) CD = CD	2) Reflexive
3) BC + CD = DE + CD	3) Addition (1, 2)
4) BC + CD = BD DE + CD = CE	4) A whole is equal to the sum of its parts
5) BD = CE	5) Substitution (3, 4)

27.

Write a two-column proof of the following.

Given: $BD = CE$

Prove: $BC = DE$



Statements	Reasons
1) $BD = CE$	1) Given
2) $BC+CD=BD$, $CD+DE=CE$	2) A whole is equal to the sum of its parts.
3) $BC+CD=CD+DE$	3) Substitution (1,2)
4) $CD=CD$	4) Reflexive
5) $BC=DE$	5) Subtraction (3,4)

Reviewing Algebra:

28. Simplify completely.

$$\frac{5n-5\sqrt{3n^2}}{5\sqrt{16n}}$$

$$\frac{5n-5n\sqrt{3}}{5\cdot 4\sqrt{n}} = \frac{5n-5n\sqrt{3}}{20\sqrt{n}}\cdot\frac{\sqrt{n}}{\sqrt{n}} = \frac{5n\sqrt{n}-5n\sqrt{3n}}{20n}$$

$$\frac{5n(\sqrt{n}-\sqrt{3n})}{5n\cdot 4}$$

$$\frac{\sqrt{n}-\sqrt{3n}}{4}$$

Simplify completely.

$$\frac{5x}{1-2x}-\frac{2x}{2x+1}+\frac{3}{4x^2-1}$$

LCD: $(2x-1)(2x+1)$

$$\frac{5x}{1-2x}-\frac{2x}{2x+1}+\frac{3}{(2x-1)(2x+1)}$$

pull out -1

$$\frac{-5x}{2x-1}\cdot\frac{2x+1}{2x+1}-\frac{2x}{2x+1}\cdot\frac{2x-1}{2x-1}+\frac{3}{(2x+1)(2x-1)}$$

$$\frac{-5x(2x+1)}{(2x-1)(2x+1)}-\frac{2x(2x-1)}{(2x+1)(2x-1)}+\frac{3}{(2x+1)(2x-1)}$$

$$\frac{-10x^2-5x-4x^2+2x+3}{(2x-1)(2x+1)}$$

$$\frac{-14x^2-3x+3}{(2x-1)(2x+1)}$$

30. Solve for n.

$$8n^2+4n-16=-n^2$$

$9n^2+4n-16=0$

not factorable!

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

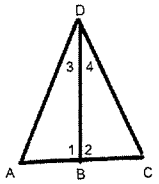
$$x=\frac{-(4)\pm\sqrt{(4)^2-4(9)(-16)}}{2(9)}$$

$$\frac{-4\pm\sqrt{592}}{18}$$

$$\frac{-4\pm\sqrt{16}\sqrt{37}}{18} \rightarrow \frac{-4\pm 4\sqrt{37}}{18} \rightarrow \frac{2(-2\pm 2\sqrt{37})}{9\cdot 18}$$

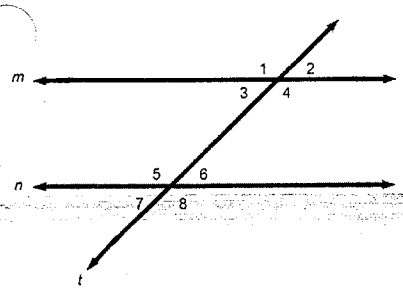
$$\frac{-2\pm 2\sqrt{37}}{9}$$

31. Fill in the missing statements or reasons using the diagram below. Assume each of the questions is completely separate from one another.



1. $\overline{AC} \perp \overline{DB}$ 2. $\angle 1$ and $\angle 2$ are right angles	1. Given 2. Def of ⊥ lines: If lines are ⊥ then they form right angles
1. $\overline{AC} \perp \overline{DB}$ 2. $\angle 1 \cong \angle 2$	1. Given 2. If lines are ⊥ then they intersect to form ≅ adjacent angles.
1. $\angle 1 \cong \angle 2$ 2. $\overline{AC} \perp \overline{DB}$	1. Given 2. If lines intersect to form ≅ adjacent angles then the lines are ⊥.
1. $\angle 1$ and $\angle 2$ are supplementary	1. Linear pairs are supplementary.
1. $\overline{DB}$ bisects $\angle ADC$ 2. $\angle 3 \cong \angle 4$	1. Given 2. Def of angle bisector: If a ray bisects an angle then it divides the angle into 2 ≅ angles
1. B is the midpoint of $\overline{AC}$ 2. $\overline{AB} \cong \overline{BC}$	1. Given 2. Def of a midpoint: If a point is a midpoint then it divides a segment into 2 ≅ parts
1. $\overline{DB}$ bisects $\angle ADC$ 2. $m\angle 3 = \frac{1}{2} m < ADC$	1. Given 2. Angle bisector theorem
1. B is the midpoint of $\overline{AC}$ 2. $AC = 2AB$	1. Given 2. Midpoint theorem

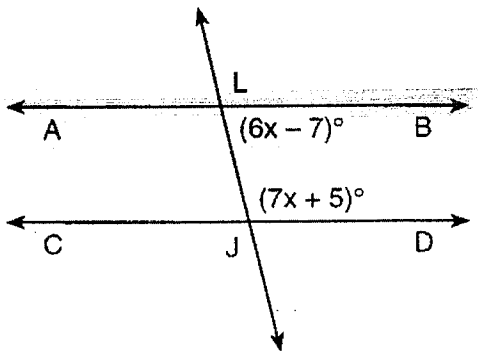
32. Fill in the missing statements or reasons using the diagram below. Assume each of the questions is completely separate from one another.



1. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$ 2. $\angle 4 \cong \angle 5$	1. Given 2. If lines are ∥ then alternate interior angles are ≅.
1. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$ 2. $\angle 2 \cong \angle 6$	1. Given 2. If lines are ∥ then corresponding angles are ≅
1. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$ 2. $\angle 3$ is supplementary to $\angle 5$	1. Given 2. If lines are ∥ then same-side interior angles are supplementary.
1. $\angle 6 \cong \angle 7$	1. Vertical angles are ≅.
1. $\angle 6$ is supplementary to $\angle 8$	1. Linear pairs are supplementary
1. $\angle 3 \cong \angle 6$ 2. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$	1. Given 2. If alternate interior angles are ≅ then lines are ∥.
1. $\angle 1 \cong \angle 5$ 2. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$	1. Given 2. If corresponding angles are ≅ then the lines are ∥.
1. $\angle 6$ is supplementary to $\angle 4$ 2. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$	1. Given 2. If same-side interior angles are supplementary, then the lines are ∥
1. $\angle 6$ is supplementary to $\angle 1$ 2. $\angle 1$ is supplementary to $\angle 2$ 3. $\angle 6 \cong \angle 2$ 4. $\overleftrightarrow{m} \parallel \overleftrightarrow{n}$	1. Given 2. Linear pairs are supplementary. 3. Supplements of the same angle are ≅. 4. If corresponding angles are ≅ then the lines are ∥.

33.

In the accompanying diagram, $\overleftrightarrow{ALB} \parallel \overleftrightarrow{CJD}$ and $\overleftrightarrow{LJ}$ is a transversal. If $m\angle JLB = 6x - 7$ and $m\angle LJD = 7x + 5$, find the value of x.



$6x-7+7x+5=180$

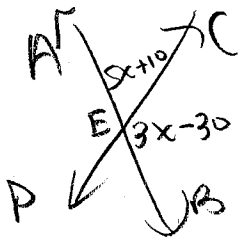
$13x-2=180$

$13x=182$

$x=14$

34.

If AB and CD intersect at E and the m<AEC = 5x + 10 and m<CEB = 3x - 30, find m<CEB.



$5x+10+3x-30=180$

$8x-20=180$

$8x=200$

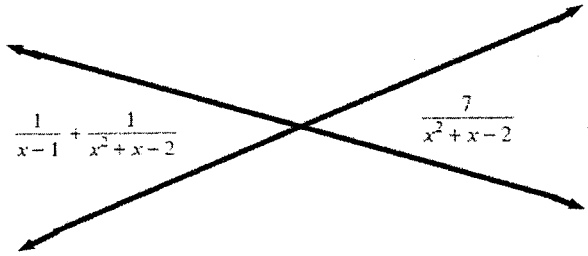
$x=25$

$m\angle CEB = 3(25)-30$

$75-30$

$45°$

35. Find the value(s) of x.



$\frac{1}{x-1}+\frac{1}{x^2+x-2}=\frac{7}{x^2+x-2}$

LCD: $(x-1)(x+2)$

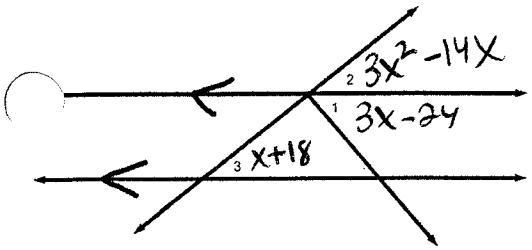
$(x-1)(x+2)\left[\frac{1}{x-1}+\frac{1}{(x-1)(x+2)}=\frac{7}{(x-1)(x+2)}\right]$

$x+2+1=7$

$x+3=7$

$x=4$

36.



$m\angle 1 = 3x - 24$

$m\angle 2 = 3x^2 - 14x$

$m\angle 3 = x + 18$

Find the value(s) of x.

$3x^2 - 14x = x + 18$

$3x^2 - 15x - 18 = 0$

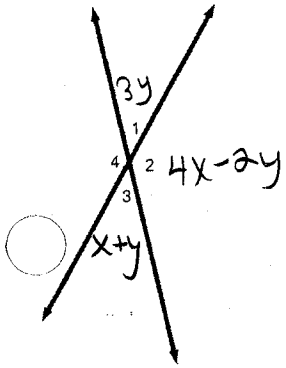
$3(x^2 - 5x - 6) = 0$

$3(x-6)(x+1) = 0$

$x - 6 = 0 \quad x + 1 = 0$

$x = 6 \vee x = -1$

37.



$m\angle 1 = 3y$

$m\angle 2 = 4x - 2y$

$m\angle 3 = x + y$

Find the values of x and y.

$3y = x + y$

$2y = x$

$x + y + 4x - 2y = 180$

$5x - y = 180$

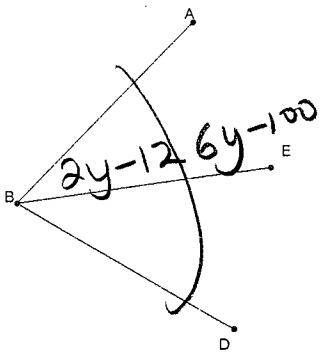
$5(2y) - y = 180$

$10y - y = 180$

$9y = 180$

$y = 20, \; x = 40$

38. If $\overline{BE}$ bisects the m<ABD, m<ABE = (2y - 12) and m<ABD = (6y - 100), find the value of y.



$2(2y - 12) = 6y - 100$

$4y - 24 = 6y - 100$

$\frac{76}{2} = \frac{2y}{2}$

$y = 38$