For problems 1–10, answer true or false.

1. Given any three distinct points A, B, and C, they will be coplanar.

2. A right triangle can have an interior, obtuse angle.

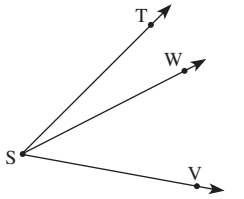
3. The statement, "$\overline{AB} \cong \overline{XY}$ and $\overline{XY} \cong \overline{MN}$ implies $\overline{AB} \cong \overline{MN}$," is an example of substitution.

4. $\angle TSV$ in the figure shown can also be called $\angle S$

5. Points T and V are collinear

6. "$\angle TSW + \angle WSV \cong \angle TSV$," is a valid statement.

7. "$m\angle TSW = -15°$," violates the protractor postulate.



Problems 4–7

8. Angles of measure $(3x + 50)°$ and $(40 - 3x)°$ are complementary.

9. If the conditional statement, P→Q is false, then the contrapositive of this statement must be true.

10. In $\triangle DEF$ (not shown), if $\overline{DE} \cong \overline{FD}$ it must be either an isosceles triangle or an equilateral triangle.

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11. Consider the statement and assume it to be true: "If I complete this review then I will pass the test."

(a) What is the hypothesis?

(b) State the converse, the inverse and the contrapositive.

(c) Which variations (if any) of this statement must be true (inverse, converse, and/or contrapositive)?

12. Draw a conclusion if possible.

1. If the Padres win more than 100 games then they will win the division.
2. The Padres won less than 100 games.

C.

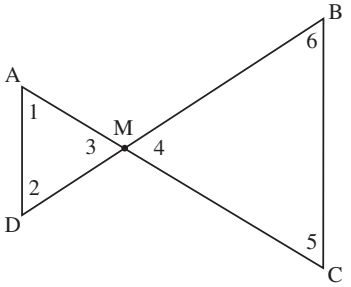
13. Given M is the midpoint of $\overline{AB}$ (not shown). If $AB = 2x + 6$ and $MB = 3x - 9$, find AM.

14. *Given:* $\overline{AD} \parallel \overline{BC}$; $m\angle 1 = 60°$; $m\angle 6 = 55°$

Find: $m\angle 3$

15. *Given:* $m\angle AMB = x + 2y$
$m\angle 3 = x$
$m\angle 4 = 2x - 2y$

Find: x and y



Problems 14 & 15

16. Given $m \parallel n$, cut by transversal l. Give a reason for each of the following statements.

(a) $\angle 4 \cong \angle 9$

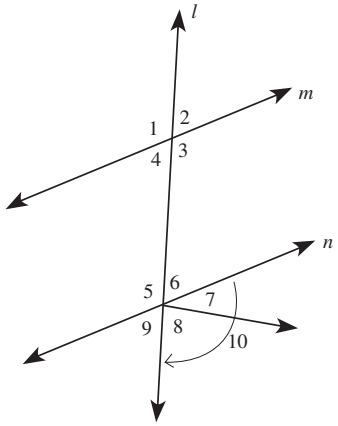
(b) $\angle 3$ and $\angle 6$ are supplementary

(c) $\text{m}\angle 7 + \text{m}\angle 8 = \text{m}\angle 10$

(d) $\angle 4 \cong \angle 6$

17. *Given:* $\text{m}\angle 1 = 112°$
$\angle 8 \cong \angle 6$

Find: $\text{m}\angle 7$



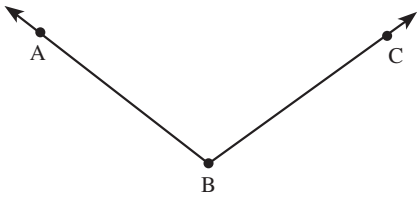
Problem 16 & 17

18. Using only a compass and a straightedge, perform the following constructions.

(a) Construct $\angle$DEF congruent to $\angle$ABC on a separate sheet of paper so that DE = 2AB and EF = 2BC.

(b) Bisect $\angle$DEF, label the bisector $\overrightarrow{\text{EX}}$.

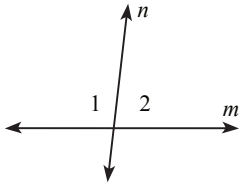
(c) Construct a line perpendicular to $\overrightarrow{\text{EF}}$ passing through point X (creating a right triangle).



19. *Given:* $3(x + 2) = -18$

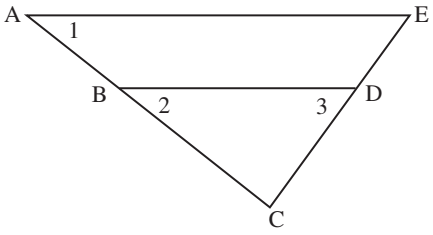
Prove: $x = -8$

20. Write a paragraph proof for the statement: "If $\angle 1 \ncong \angle 2$ then line n is not perpendicular to line m."



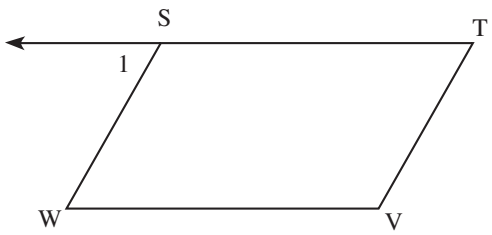
21. *Given:* $\angle 1$ is complementary to $\angle 3$
$\overline{\text{AE}} \parallel \overline{\text{BD}}$

Prove: $\angle$C is a right angle



22. *Given:* $\angle \text{W} \cong \angle \text{T}$
$\overrightarrow{\text{TS}} \parallel \overline{\text{VW}}$

Prove: $\overline{\text{SW}} \parallel \overline{\text{TV}}$



Answers

1. true **2.** false **3.** false **4.** false **5.** true **6.** false **7.** true **8.** true **9.** false **10.** true **11.** (a) "I complete this review" (b) Converse: "If I pass the test then I completed the review"; Inverse: "If I don't complete this review then I won't pass the test."; Contrapositive: "If I don't pass the test, I didn't complete the review." (c) Contrapositive **12.** no conclusion can be made **13.** AM = 9 **14.** 65° **15.** $x = 60, y = 30$ **16.** (a) corresponding angles (b) interior angles on the same side of the transversal (c) angle addition postulate (d) alternate interior angles **17.** 44°

19.

Statement	Reasoning
1. $3(x+2) = -18$	1. Given
2. $3x + 6 = -18$	2. Distributive prop
3. $3x = -24$	3. Addition prop of eq
4. $x = -8$	4. Multiplication prop of eq

20. Assume $m \perp n$. By the definition of $\perp$, $\angle 1 \cong \angle 2$. But this contradicts our hypothesis, therefore line m must not be perpendicular to line n.

21.

Statement	Reasoning
1. $\angle 1$ is complementary to $\angle 3$	1. Given
2. $\mathrm{m}\angle 1 + \mathrm{m}\angle 3 = 90°$	2. Def of complementary
3. $\overline{\mathrm{AE}} \parallel \overline{\mathrm{BD}}$	3. Given
4. $\mathrm{m}\angle 1 = \mathrm{m}\angle 2$	4. Corresponding angles
5. $\mathrm{m}\angle 1 + \mathrm{m}\angle 2 = 90°$	5. Substitution
6. $\mathrm{m}\angle 1 + \mathrm{m}\angle 2 + \mathrm{m}\angle \mathrm{C} = 180°$	6. Sum of the $\angle$s of a $\triangle$ eq 180°
7. $90° + \mathrm{m}\angle \mathrm{C} = 180°$	7. Substitution
8. $\mathrm{m}\angle \mathrm{C} = 90°$	8. Addition prop of eq
9. $\angle \mathrm{C}$ is a rt $\angle$	9. Def of rt $\angle$

22.

Statement	Reasoning
1. $\angle \mathrm{W} \cong \angle \mathrm{T}$, $\overleftrightarrow{\mathrm{TS}} \parallel \overline{\mathrm{VW}}$	1. Given
2. $\angle \mathrm{W} \cong \angle 1$	2. Corresponding angles
3. $\angle \mathrm{T} \cong \angle 1$	3. Transitive prop of $\cong$
4. $\overline{\mathrm{SW}} \parallel \overline{\mathrm{TV}}$	4. If corresp $\angle$s are $\cong$, then lines are $\parallel$