Name: Key Date: _____ Period: _____

1.7 Theorems about Angle Pairs

1. Write the correct letter of each diagram in front of its corresponding term.

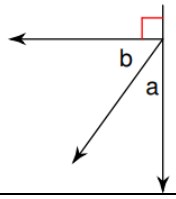
D Vertical Angles

C Linear Pair

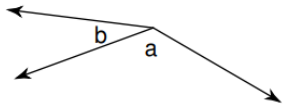
B Adjacent Angles

A Complementary Angles

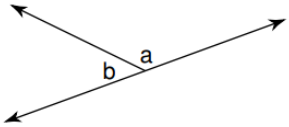
A.



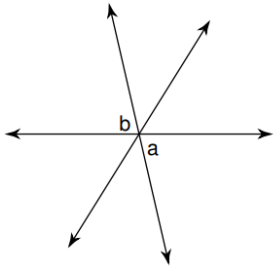
B.



C.

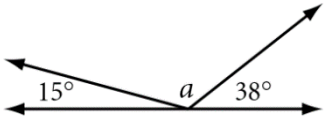


D.



In problems 2-5, solve for the variable(s) in each diagram.

2.

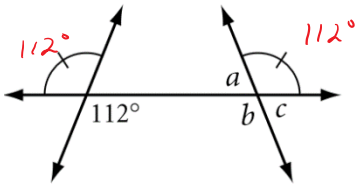


$15° + a + 38° = 180°$

$a + 53° = 180°$

$a = 127°$

3.



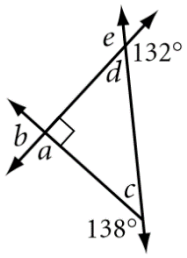
$b = 112°$

$a + 112° = 180°$

$a = 68°$

$c = 68°$

4.



$a = 90°$ $b = 90°$

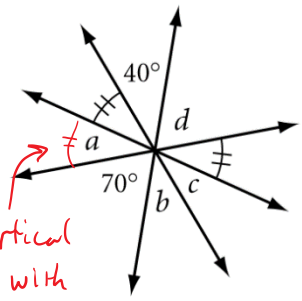
$e = 132°$ $d + 132° = 180°$

$d = 48°$

$c + 138° = 180°$

$c = 42°$

5.



Vertical ∠ with other two-tick one!

$b = 40°$ $d = 70°$

$2a + 70° + b = 180°$

$2a + 70° + 40° = 180°$

$2a = 70°$

$a = 35°$

$c = 35°$

6. Given the diagram below, classify each statement as *always true* (A), *sometimes true* (S), or *never true* (N).

A $m\angle 1 + m\angle 4 = 180°$

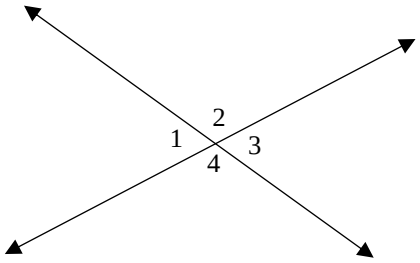
N $m\angle 1 + m\angle 2 + m\angle 3 = 180°$

S $m\angle 2 + m\angle 4 = 180°$ → if lines are ⊥

S $\angle 2 \cong \angle 3$ → if lines are ⊥

A $\angle 2 \cong \angle 4$

S $m\angle 3 = m\angle 4$ → if lines are ⊥



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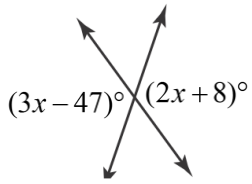
In problems 7-12, solve for *x*.

7.

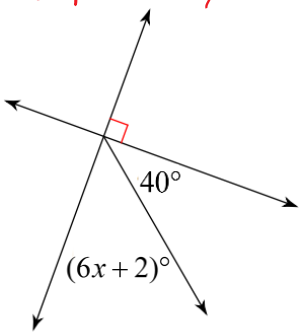


$3x-47=2x+8$

$x=55$

Vertical ∠s are ≅

8. complementary ∠s



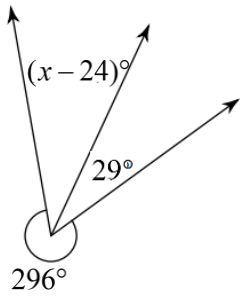
$6x+2+40=90$

$6x+42=90$

$6x=48$

$x=8$

9.



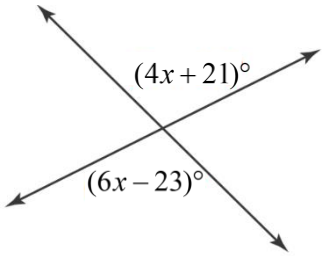
$x-24+29+296=360$

$x+301=360$

$x=59$

360° in a full circle!

10.



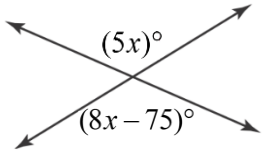
$4x+21=6x-23$

$44=2x$

$x=22$

Vertical ∠s are ≅!

11.



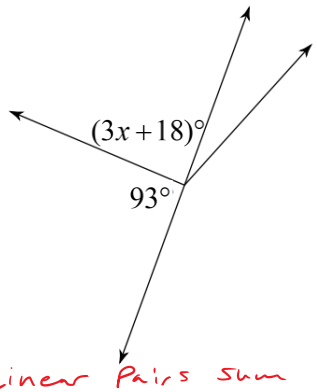
$5x=8x-75$

$75=3x$

$x=25$

Vertical ∠s are ≅!

12.



$3x+18+93=180$

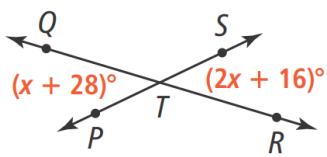
$3x+111=180$

$3x=69$

$x=23$

Linear pairs sum to 180°!

13. Error Analysis A student uses the Vertical Angles Theorem and the definition of complementary angles when solving for $m\angle PTR$. Correct the student's work, then describe the error the student made.



Correct Work:

$2x+16=x+28$

$x=12$

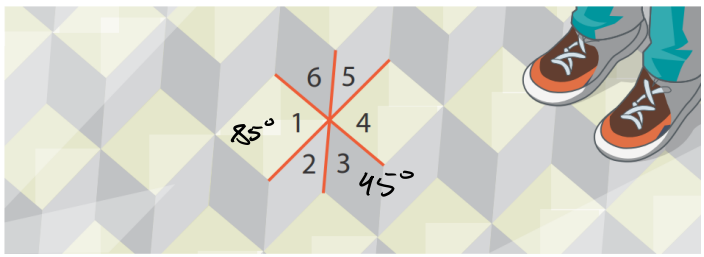
$\therefore m\angle QTP=12+28=40°$

$\therefore m\angle PTR=180°-40°=140°$

Error:

The student thought that linear pairs are complementary, but they actually are supplementary!

14. Use Structure A type of floor tiling is designed to give the illusion of a three-dimensional figure. Given that $m\angle 1=85°$ and $m\angle 3=45°$, what are the measures of the remaining angles?



$m\angle 1=85°$

$m\angle 4=85°$

$m\angle 3=45°$

$m\angle 6=45°$

$m\angle 1+m\angle 2+m\angle 3=180°$

$m\angle 2+85°+45°=180°$

$m\angle 2=50°$

$m\angle 5=50°$