Solving for Angles on Parallel Lines

Remember:

If the lines are parallel, then angles that are corresponding or alternate are congruent – set them equal.

If the lines are parallel, then angles that are same side interior are supplementary – add them to equal 180˚.

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| 1. $∠1$ and $∠2$ are corresponding angles on parallel lines. $m∠1=32˚$. $m∠2= ?$ | 2. $∠3$ and $∠4$ are alternate interior angles on parallel lines. $m∠3=87˚$. $m∠4= ?$ | 3. $∠5$ and $∠8$ are same side interior angles on parallel lines. $m∠8=37˚$. $m∠5= ?$ |
| 4. $∠ABC$ and $∠$BCD are same side interior angles on parallel lines. $m∠BCD=102˚$. $m∠ABC= ?$ | 5. $∠DEF$ and $∠EGH$ are corresponding angles on parallel lines. $m∠EGH=61˚$. $m∠DEF= ?$ | 6. $∠KLM$ and $∠PNR$ are alternate exterior angles on parallel lines. $m∠KLM=102˚$. $m∠PNR= ?$ |
| 7. $∠6$ and $∠9$ are alternate interior angles on parallel lines. $m∠6=(5x+17)˚$ & $m∠9=(9x-15)˚$. $m∠9= ?$ | 8. $∠1$ and $∠3$ are same side interior angles on parallel lines. $m∠1=(6x+4)˚$ & $m∠3=(7x+20)˚$. $m∠1= ?$ | 9. $∠7$ and $∠12$ are corresponding angles on parallel lines. $m∠7=\left(34x-3\right)˚$ & $m∠12=(18x+45)˚$. $m∠7= ?$ |
| 10. $∠LMN$ and $∠MPQ$ are corresponding angles on parallel lines. $m∠LMN=\left(7x-8\right)˚$ & $m∠MPQ=(6x+12)˚$. $m∠LMN= ?$ | 11. $∠XYZ$ and $∠DEF$ are alternate exterior angles on parallel lines. $m∠XYZ=(11x-24)˚$ & $m∠DEF=(9x-16)˚$. $m∠DEF= ?$ | 12. $∠STV$ and $∠TVW$ are same side interior angles on parallel lines. $m∠STV=(19x-4)˚$ & $m∠TVW=(21x-16)˚$. $m∠STV= ?$ |
| 13. $∠7$ and $∠3$ are alternate interior angles on parallel lines. $m∠7=48˚$ & $m∠3=(6x-6)˚$. $x= ?$ | 14. $∠5$ and $∠9$ are corresponding angles on parallel lines. $m∠5=(3x+8)˚$ & $m∠9=53˚$. $x= ?$ | 15. $∠1$ and $∠6$ are same side interior angles on parallel lines. $m∠1=107˚$ & $m∠6=(8x-23)˚$. $x= ?$ |

For each problem: **A. Identify the angle pairs** & **B. write whether you should set them equal or add them to equal 180˚.**

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|  | 16. $∠1$ & $∠2$ | 17. $∠1$ & $∠3$ | 18. $∠1$ & $∠5$ | 19. $∠1$ & $∠7$ |
| 20. $∠1$ & $∠8$ | 21. $∠2$ & $∠8$ | 22. $∠2$ & $∠7$ | 23. $∠2$ & $∠3$ |
| 24. $∠2 $& $∠4$ | 25. $∠2$ & $∠6$ | 26. $∠7$ & $∠8$ | 27. $∠7$ & $∠3$ |

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|  | 28. $∠1$ & $∠2$ | 29. $∠1$ & $∠3$ | 30. $∠1$ & $∠5$ | 31. $∠1$ & $∠7$ |
| 32. $∠1$ & $∠8$ | 33. $∠2$ & $∠8$ | 34. $∠2$ & $∠7$ | 35. $∠2$ & $∠6$ |
| 36. $∠2 $& $∠4$ | 37. $∠2$ & $∠5$ | 38. $∠7$ & $∠8$ | 39. $∠7$ & $∠6$ |

Angle Types

Alternate Exterior

Alternate Interior

Corresponding

Linear Pair

Same Side Interior

Vertical

40. Which angle pair(s) are congruent (the same) only when the lines are parallel?

41. Which angle pair(s) are supplementary (add to equal 180˚) only when the lines are parallel?

42. Which angle pair(s) are always congruent, even if there are no parallel lines?

43. Which angle pair(s) are always supplementary, even if there are no parallel lines?