1. *a* = 60°, *b* = 120°, *c* = 120°
2. *a* = 90°, *b* = 90°, *c* = 50°
3. *a* = 77°, *b* = 52°, *c* = 77°, *d* = 51°
4. *a* = 60°, *b* = *c* = 120°, *d* = *f* = 115°, *e* = 65°, *g* = *i* = 125°, *h* = 55°
5. *a* = 90°, *b* = 163°, *c* = 17°, *d* = 110°, *e* = 70°
6. The measures of the linear pair of angles add up to 170°, not 180°.
7. The angles at which he should cut measure 45°.
8. Greatest: 120°. Smallest: 60°. One possible explanation: The tree is perpendicular to the horizontal. The angle of the hill measures 30°. The smaller angle and the angle between the hill and the horizontal form a pair of complementary angles, so the smaller angle equals 90° − 30° = 60°. The smaller angle and larger angle form a linear pair, so the larger angle equals 180° − 60° = 120°
9. sample counterexample:  The converse is not true.
10. … each must be a right angle.
11. Let the measures of the congruent angles be *x*. They are supplementary, so *x* + *x* = 180°, 2*x* = 180°, *x* = 90°. Thus each angle is a right angle.
12. 63°
13. 90°
14. No. By Corresponding Angles Conjecture and Linear Angles the two angles should add up to 180°. 68° + 122° ≠ 180°
15. 57°
16. yes
17. 113°
18. *a* = *d* = 64°, *b* = *c* = 116°, *e* = *g* = *i* = *j* = *k* = 108°, *f* = *h* = *s* = 72°, *m* = 105°, *n* = 79°, *p* = 90°, *q* = 116°, *t* = 119°; Possible explanation: Using the Vertical Angles Conjecture, *n* = 79°. Using the Linear Pair Conjecture, *p* = 90°. Using the Corresponding Angles Conjecture and *b* = 116°, *q* = 116°.
19. Possible answer: In the diagram, lines *ℓ* and *m* are parallel and intersected by transversal *k*. Using the Corresponding Angles Conjecture, ∠1 ≅ ∠2. Using the Vertical Angles Conjecture, ∠2 ≅ ∠3. Because ∠1 and ∠3 are both congruent to ∠2, they must be congruent to each other. So ∠1 ≅ ∠3. Therefore, if two parallel lines are cut by a transversal, then alternate exterior angles are congruent. ****
20. 56° + 114° = 170° ≠ 180°. Thus, the lines marked as parallel cannot really be parallel.
21. Alternate interior angles measure 55°, but 55° + 45° ≠ 180°.
22. 20°