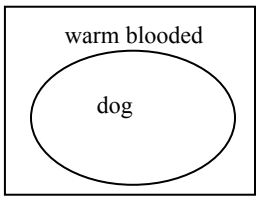
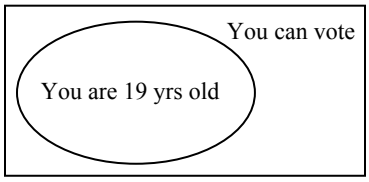
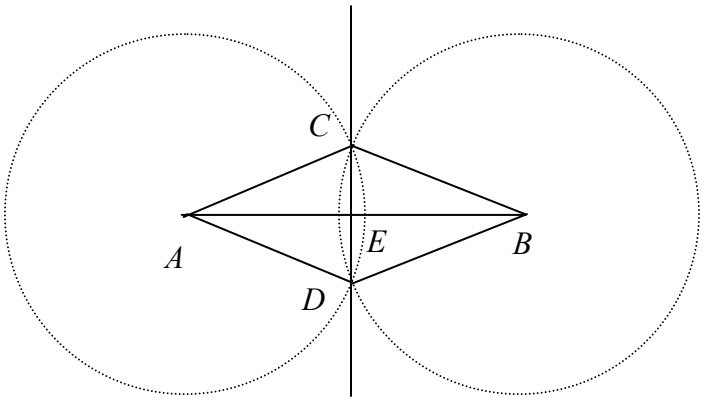
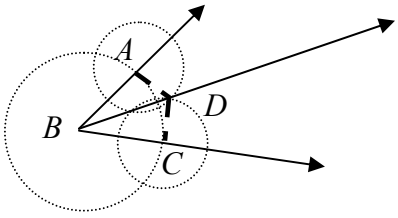
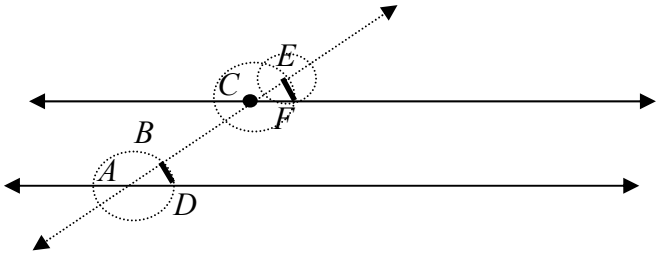
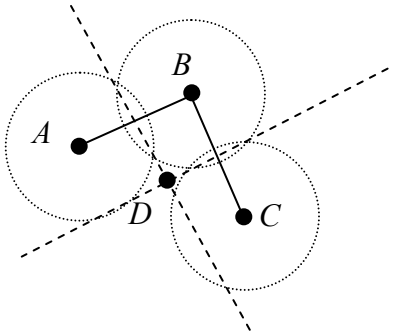
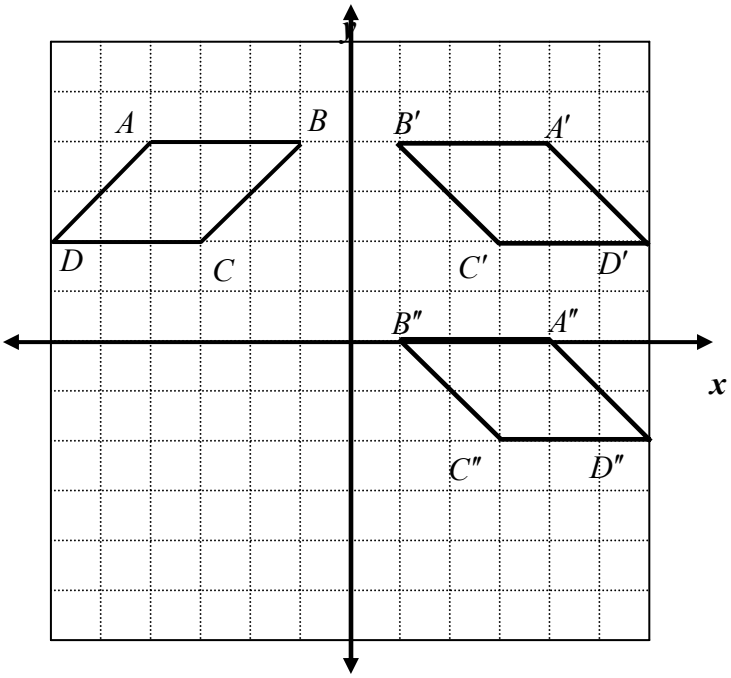
1.	**B**
2.	**D**
3.	**B**
4a.	$ADFE$
4b.	$\overleftrightarrow{AB}$
5.	30
6.	8
7.	20
8.	130
9a.	$\overline{EG} \cong \overline{FH}$
9b.	43
10.	–3 and 13
11a.	5
11b.	30^{o}
12.	$x = 20, y = 80$
13.	**B**
14.	**D**
15a.	$F(x, y) = (x, -y)$
15b.	$F(x, y) = (-x, y)$
15c.	$F(x, y) = (y, x)$
15d.	$F(x, y) = (-x, -y)$
15e.	$F(x, y) = (x + 5, y - 3)$
16a.	
16b.	If the animal is warm-blooded, then the animal is a dog.
16c.	If the animal is not a dog, then the animal is not warm-blooded.
16d.	If the animal is not warm-blooded, then the animal is not a dog.
17.	**C**
18.	If it is sunny today, I will go to the store; If I go to the store, I will buy candy; If I buy candy, I will not eat my dinner.
19.	If Chris earns $10, then he will bring Jane.
20a.	
20b.	If X represents a voter, then the X is inside the box, It may or may not be in the oval, so the statement is not necessarily true.

21a.	Triangle ABC is equiangular.
21b.	Sally does not study for the test.
22.	A
23a.	indirect
23b.	**C**
24a.	parallelogram
24b.	rhombus and parallelogram
24c.	rectangle and parallelogram
24d.	none of the figures
25a.	 Justification: Congruent circles were constructed with centers at points A and B, therefore, since radii of congruent circles are congruent, $\overline{AC} \cong \overline{BC} \cong \overline{AD} \cong \overline{BD}$. Therefore $ABCD$ is a rhombus. In the rhombus, the diagonals are perpendicular, therefore $\overline{AB} \perp \overline{CD}$. Since ABCD is a parallelogram the diagonals bisect each other. Therefore $\overline{AE} \cong \overline{EB}$, so $\overline{CD}$ is the perpendicular bisector of $\overline{AB}$.
25b.	 Justification: $\overline{AB} \cong \overline{BC}$ since they are the radii of the same circle. $\overline{AD} \cong \overline{DC}$ since they are constructed using the same compass setting. $\overline{BD} \cong \overline{BD}$ by the reflexive property of congruence. Therefore $\triangle ABD \cong \triangle CBD$ by SSS. $\angle ABC \cong \angle CBD$ by CPCTC, and by the definition of angle bisector $\overrightarrow{BD}$ bisects $\angle$ABC.

25c.	 Justification: $\overline{AB} \cong \overline{CE}, \overline{AD} \cong \overline{CF}$ since they were drawn by the same compass setting. $\overline{BD} \cong \overline{EF}$ since they were drawn with the same compass setting. Therefore $\triangle BAD \cong \triangle ECF$ by SSS. Therefore $\angle BAD \cong \angle ECF$ by CPCTC. Finally by the converse of the corresponsing angles postulate, $\overleftrightarrow{CF} \,//\, \overleftrightarrow{AD}$.
25d.	 Justification. I drew segments between A and B and B and C. I constructed the perpendicular bisector of $\overline{AB}$. Every point on that line is equidistant from points A and B. I constructed the perpendicular bisector of $\overline{BC}$. Every point on that line is equidistant from points B and C. Therefore, point D, the intersection of those two perpendicular bisectors, is equidistant from points A, B, and C.
26.	540 degrees
27.	156 degrees
28.	40 degrees
29.	8 sides
30.	6 sides
31.	Charlie is correct. The basic rotational symmetry is 360 degrees divided by the number of sides. $360 \div 6 = 60$, so any multiple of 60 degrees will work.

32.	 • $C'(3,2), C''(3,-2)$ • $P''(x,y) = (-x, y-4)$ The reflection across the *y*-axis makes the *x*-coordinate the opposite, while the translation downward subtracts 4 from the *y*-coordinate.
33.	$108^o - 72^o = 36^o$
34.	**C**
35a.	12
35b.	10
35c.	25
35d.	25
36a.	$x = 20$
36b.	$x = 30$
36c.	$y = 110$
36d.	$x = 20, y = 110$
37.	**C**
38.	4,5,6,7,8,9,10,11,12,13,14
39a.	SAS
39b.	cannot be proven congruent
39c.	ASA
39d.	SSS
39e.	cannot be proven congruent
39f.	AAS

40. A two-column proof is given. A paragraph or flowchart proof is also acceptable.

Statements	Reasons
1. $\overline{BD}$ is the perp. bisector of $\overline{AC}$	1. Given
2. $\angle BEA$ and $\angle BEC$ are right angles	2. Definition of perpendicular
3. $\angle BEA \cong \angle BEC$	3. All right angles are congruent
4. $\overline{AE} \cong \overline{EC}$	4. Definition of bisector
5. $\overline{BE} \cong \overline{BE}$	5. Reflexive Property of Congruence
6. $\triangle BEA \cong \triangle BEC$	6. SAS
7. $\angle BAC \cong \angle BCA$	7. CPCTC

41. Corresponding parts of congruent figures are congruent.

42. Point, Line, and Plane

43a. Inductive reasoning

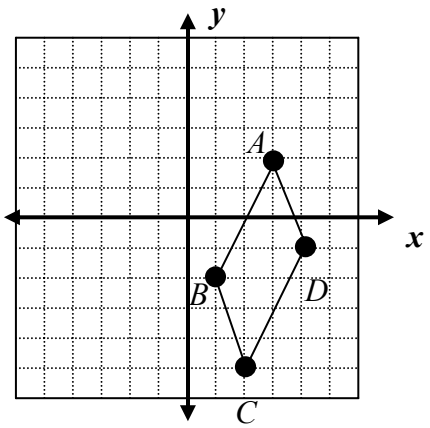
43b. Inductive reasoning

43c. Deductive reasoning

43d. Deductive reasoning

43e. Inductive reasoning

44.



- The quadrilateral is a parallelogram.
  The slopes of $\overline{AB}$ & $\overline{CD}$ equal 2, so $\overline{AB} \parallel \overline{CD}$.
  The slopes of $\overline{AD}$ & $\overline{BC}$ equal –3, so $\overline{AD} \parallel \overline{BC}$.
- The quadrilateral is not a rectangle or a square, since the slopes of $\overline{AD}$ & $\overline{CD}$ are not opposite reciprocals (do not have a product of –1).
- The quadrilateral is not a rhombus since the slopes of the diagonals are not opposite reciprocals. $m\overline{BD} = \frac{1}{3}, m\overline{AC} = 7$.

45a. 3 parallelograms

45b. (–1,–1), (3,3), and (–5,–1)

46. The triangle is a right triangle. $m\overline{AB} = \frac{2}{7}, m\overline{AC} = -\frac{7}{2}$. So $\overline{AB} \perp \overline{AC}$.

47. A 2-column proof is given. A paragraph or flowchart proof is also acceptable.

Statements	Reasons
1. $\overline{BD} \parallel \overline{EG}$	1. Given
2. $\angle BCF \cong \angle CFG$	2. If 2 // lines are cut by a transversal, alternate interior angles are congruent.
3. $\overline{BC} \cong \overline{FG}$	3. Given
4. $\overline{CF} \cong \overline{CF}$	4. Reflexive property of congruence
5. $\triangle BCF \cong \triangle GFC$	5. SAS
6. $\angle CBF \cong \angle CGF$	6. CPCTC

Alternative proof: Given that $\overline{BD} \parallel \overline{EG}$ and $\overline{BC} \cong \overline{FG}$, then one pair of opposite sides of quadrilateral *BCFG.* Therefore BCFG is a parallelogram. Since opposite angles of a parallelogram are congruent, then $\angle CBF \cong \angle CGF$.

48a. lines *n* and *p*. Corresponding angles are congruent.

48b. lines *l* and *m*. Alternate interior angles are congruent.

48c. lines *l* and *m*. Adjacent interior angles are supplementary.

49a. 4

49b. 8

49c. an infinite number

50.

Property	Parallelogram	Rectangle	Square	Rhombus	Trapezoid
1. Opposite sides congruent	x	x	x	x	
2. One pair of opposite sides parallel					x
3. Opposite angles congruent	x	x	x	x	
4. Each diagonal forms 2 congruent triangles	x	x	x	x	
5. Diagonals bisect each other	x	x	x	x	
6. Diagonals congruent		x	x		
7. Diagonals perpendicular			x	x	
8. A diagonal bisects two angles			x	x	
9. All angles are right angles		x	x		
10. All sides are congruent			x	x	

51.

P	Q	$\sim P$	$P \to Q$	$P \wedge Q$	$P \vee Q$
T	T	F	T	T	T
T	F	F	F	F	T
F	T	T	T	F	T
F	F	T	T	F	F

52.

P	Q	$\sim Q$	$(P \wedge \sim Q)$	$(P \wedge \sim Q) \vee Q$	$[(P \wedge \sim Q) \vee Q] \to P$
T	T	F	F	T	T
T	F	T	T	T	T
F	T	F	F	T	F
F	F	T	F	F	T

53. $F(x, y) = (6 - x, y)$

54. the far-right columns have identical truth-values

55. *c,a,b,e,d*

56a. *q,r Chris buys gas. Chris drives to Rockville*

56b. *r Chris drives to Rockville*

56c. *no conclusion*

56d. *~ p Chris does not earn $20*

56e. *no conclusion*

57.

Statement	Reasons
1. $\angle EBC \cong \angle ECB$	1. Given
2. $\overline{EB} \cong \overline{EC}$	2. In a triangle, if two angles are congruent, the corresponding sides opposite those angles are also congruent.
3. $\overline{AB} \perp \overline{BE}$	3. Given
4. $\angle ABE$ is a right angle	4. Definition of perpendicular
5. $\overline{DC} \perp \overline{CE}$	5. Given
6. $\angle DCE$ is a right angle	6. Definition of perpendicular
7. $\angle ABE \cong \angle DCE$	7. All right angles are congruent
8. $\overline{AB} \cong \overline{CD}$	8. Given
9. $\Delta ABE \cong \Delta DCE$	9. SAS
10. $\overline{AE} \cong \overline{DE}$	10. CPCTC
