10. *Given*: m$\angle A = 50$, m$\angle B = 45$,
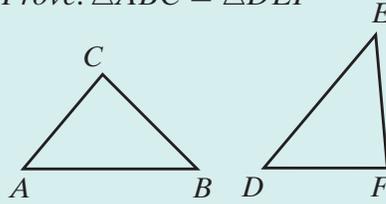$AB = 10$ cm, m$\angle D = 50$,
m$\angle E = 45$, and $DE = 10$ cm.

Prove: $\triangle ABC \cong \triangle DEF$

11. *Given*: $\overline{GEH}$ bisects $\overline{DEF}$ and
m$\angle D = $ m$\angle F$.
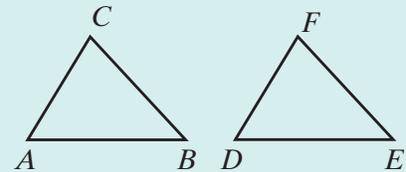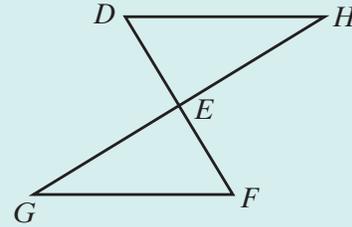
Prove: $\triangle GFE \cong \triangle HDE$

12. *Given*: $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\triangle ABC$ is
not congruent to $\triangle DEF$.
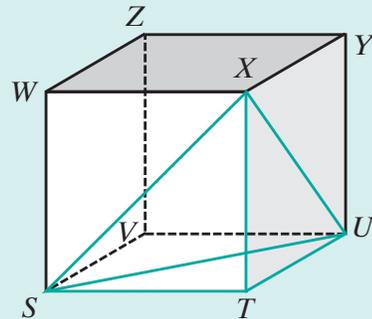
Prove: $\angle B$ is not congruent to $\angle E$.

Exploration

1. If three angles of one triangle are congruent to the corresponding angles of another triangle, the triangles may or may not be congruent. Draw diagrams to show that this is true.

2. *STUVWXYZ* is a cube. Write a paragraph proof that would convince someone that $\triangle STX$, $\triangle UTX$, and $\triangle STU$ are all congruent to one another.

CUMULATIVE REVIEW   **CHAPTERS 1–4**

Part I

Answer all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed.

1. Which of the following is an illustration of the associative property of addition?

(1) $3(4 + 7) = 3(7 + 4)$

(2) $3(4 + 7) = 3(4) + 3(7)$

(3) $3 + (4 + 7) = 3 + (7 + 4)$

(4) $3 + (4 + 7) = (3 + 4) + 7$

2. If the sum of the measures of two angles is 90, the angles are
(1) supplementary.   (3) a linear pair.
(2) complementary.   (4) adjacent angles.

3. If $AB + BC = AC$, which of the following may be false?
(1) B is the midpoint of $\overline{AC}$.   (3) B is between A and C.
(2) B is a point of $\overline{AC}$.   (4) $\overrightarrow{BA}$ and $\overrightarrow{BC}$ are opposite rays.

4. If b is a real number, then b has a multiplicative inverse only if
(1) $b = 1$ (2) $b = 0$ (3) $b \geq 0$ (4) $b \neq 0$

5. The contrapositive of "Two angles are congruent if they have the same measures" is
(1) Two angles are not congruent if they do not have the same measures.
(2) If two angles have the same measures, then they are congruent.
(3) If two angles are not congruent, then they do not have the same measures.
(4) If two angles do not have the same measures, then they are not congruent.

6. The statement "Today is Saturday and I am going to the movies" is true. Which of the following statements is false?
(1) Today is Saturday or I am not going to the movies.
(2) Today is not Saturday or I am not going to the movies.
(3) If today is not Saturday, then I am not going to the movies.
(4) If today is not Saturday, then I am going to the movies.

7. If $\triangle ABC \cong \triangle BCD$, then $\triangle ABC$ and $\triangle BCD$ must be
(1) obtuse.   (2) scalene.   (3) isosceles.   (4) equilateral.

8. If $\overleftrightarrow{ABC}$ and $\overleftrightarrow{DBE}$ intersect at B, $\angle ABD$ and $\angle CBE$ are
(1) congruent vertical angles.   (3) congruent adjacent angles.
(2) supplementary vertical angles.   (4) supplementary adjacent angles.

9. $\angle LMN$ and $\angle NMP$ form a linear pair of angles. Which of the following statements is false?
(1) $m\angle LMN + m\angle NMP = 180$
(2) $\angle LMN$ and $\angle NMP$ are supplementary angles.
(3) $\overrightarrow{ML}$ and $\overrightarrow{MP}$ are opposite rays.
(4) $\overrightarrow{ML}$ and $\overrightarrow{MN}$ are opposite rays.

10. The solution set of the equation $3(x + 2) < 5x$ is
(1) $\{x \mid x < 3\}$ (3) $\{x \mid x < 1\}$
(2) $\{x \mid x > 3\}$ (4) $\{x \mid x > 1\}$

Part II

Answer all questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit.

11. *Given*: $\overline{PQ}$ bisects $\overline{RS}$ at M and $\angle R \cong \angle S$.

   Prove: $\triangle RMQ \cong \triangle SMP$
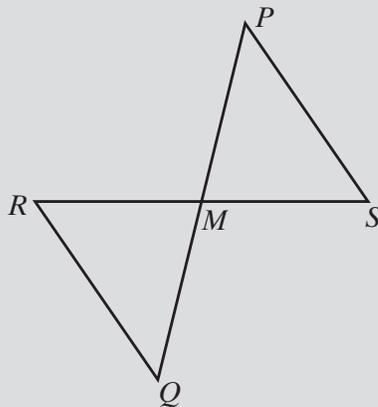
12. *Given*: Quadrilateral $DEFG$ with $DE = DG$ and $EF = GF$.

   Prove: $\triangle DEF \cong \triangle DGF$

Part III

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit.
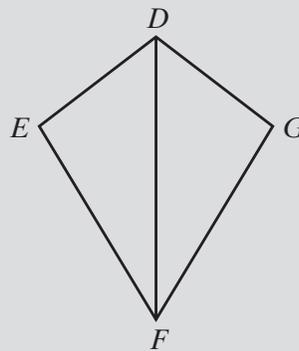
13. The following statements are true:

   If our team does not win, we will not celebrate.

   We will celebrate or we will practice.

   We do not practice.

   Did our team win? Justify your answer.

14. The two angles of a linear pair of angles are congruent. If the measure of one angle is represented by $2x - y$ and the measure of the other angle by $x + 4y$, find the values of x and of y.

Part IV

Answer all questions in this part. Each correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit.

15. Josie is making a pattern for quilt pieces. One pattern is a right triangle with two acute angles that are complementary. The measure of one of the acute angles is to be 12 degrees more than half the measure of the other acute angle. Find the measure of each angle of the triangle.

16. Triangle DEF is equilateral and equiangular. The midpoint of $\overline{DE}$ is M, of $\overline{EF}$ is N, and of $\overline{FD}$ is L. Line segments $\overline{MN}$, $\overline{ML}$, and $\overline{NL}$ are drawn.

   a. Name three congruent triangles.

   b. Prove that the triangles named in **a** are congruent.

   c. Prove that $\triangle NLM$ is equilateral.

   d. Prove that $\triangle NLM$ is equiangular.