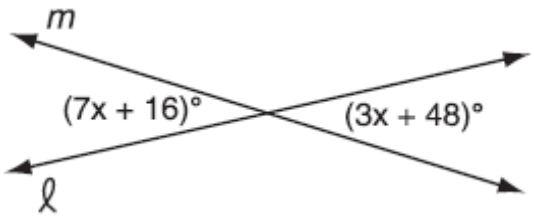
1. 060601a
In the accompanying diagram, line *a* intersects line *b*.

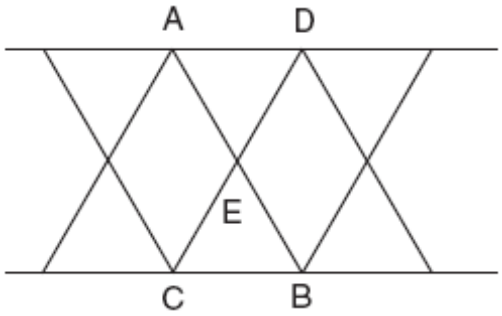
What is the value of *x*?

[A] -10 [B] 5 [C] 90 [D] 10

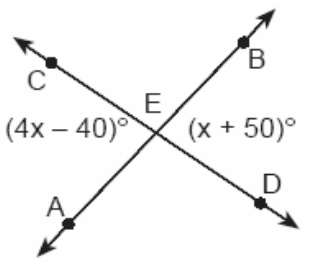
2. 080832a
The accompanying diagram shows intersecting lines ℓ and *m*. Solve for the value of *x*.



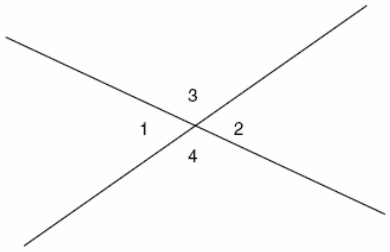
3. 010932a
The support beams on a bridge intersect in the pattern shown in the accompanying diagram. If $\overline{AB}$ and $\overline{CD}$ intersect at point *E*, $m\angle AED = 3x + 30$, and $m\angle CEB = 7x - 10$, find the value of *x*.



4. 010229a
In the accompanying diagram, $\overline{AB}$ and $\overline{CD}$ intersect at *E*. If $m\angle AEC = 4x - 40$ and $m\angle BED = x + 50$, find the number of degrees in $\angle AEC$.

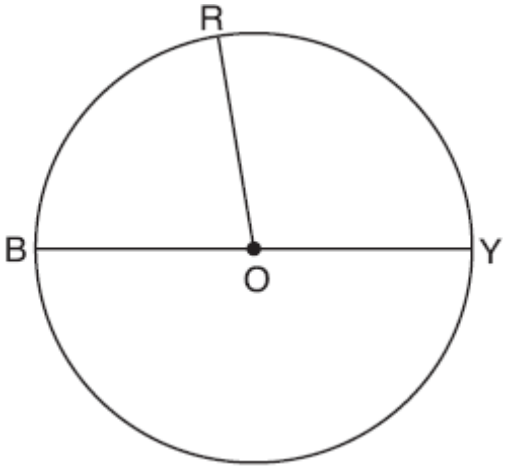


5. 010128a
In the accompanying figure, two lines intersect, $m\angle 3 = 6t + 30$, and $m\angle 2 = 8t - 60$. Find the number of degrees in $m\angle 4$.



6. 010836a

In the accompanying diagram, $\overline{BY}$ is a diameter of circle *O*, the measure of central angle *ROY* is $(x+60)°$, and the measure of central angle *ROB* is $(3x-20)°$. Find the number of degrees in the measure of central angle *ROY*.



7. 080407a

$\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at point *E*, $m\angle AEC = 6x+20$, and $m\angle DEB = 10x$. What is the value of *x*?

[A] 5 [B] $21\frac{1}{4}$ [C] 10 [D] $4\frac{3}{8}$

8. 080638a

$\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect at *E*. If $m\angle AEC = 5x-20$ and $m\angle BED = x+50$, find, in degrees, $m\angle CEB$.

9. 010313a

If the measure of an angle is represented by 2*x*, which expression represents the measure of its complement?

[A] 88*x* [B] 180 - 2*x*

[C] 90 - 2*x* [D] 90 + 2*x*

10. 060819a

Angle *A* and angle *B* are complementary angles. If $m\angle A = x$, which expression represents the number of degrees in angle *B*?

[A] 90 - *x* [B] *x* - 180

[C] *x* - 90 [D] 180 - *x*

11. 060621a

The measures of two complementary angles are represented by $(3x+15)$ and $(2x-10)$. What is the value of *x*?

[A] 37 [B] 17 [C] 35 [D] 19

12. 010823a

Two angles are complementary. The measure of one angle is 15° more than twice the other. What is the measure of the *smaller* angle?

[A] 65° [B] 25° [C] 35° [D] 55°

13. 060414a

The ratio of two supplementary angles is 2:7. What is the measure of the *smaller* angle?

[A] 20° [B] 10° [C] 40° [D] 14°

14. 010624a

The ratio of two supplementary angles is 3:6. What is the measure of the *smaller* angle?

[A] 10° [B] 30° [C] 60° [D] 20°

15. 080431a

Two angles are complementary. One angle has a measure that is five times the measure of the other angle. What is the measure, in degrees, of the larger angle?

[1] D

[2] 8, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as $7x+16+3x+14=180$.
or [1] A correct equation is written, but no further correct work is shown.
or [1] 8, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[2]

[2] 10, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as using the equation $3x+30+7x-10=180$.
or [1] A correct equation is written, but no further correct work is shown.
or [1] 10, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[3]

[3] 80, and appropriate work is shown.
[2] $x = 30$ is shown, but the student fails to substitute to find $m\angle AEC$.
or [2] $x = 30$ is shown, but the student states that the answer is $100°$, by finding the supplement of $\angle AEC$.
or [2] The student makes one computational error in the solution of the correct equation $4x - 40 = x + 50$ but appropriately substitutes the incorrect value to solve for $m\angle AEC$.
[1] The student makes one computational error in the solution of the correct equation $4x - 40 = x + 50$ and fails to substitute to find $m\angle AEC$.
or [1] The student makes more than one computational error in the solution of the correct equation $4x - 40 = x + 50$, but appropriately substitutes the incorrect value to solve for $m\angle AEC$.
or [1] 80, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[4]

[3] 120, and appropriate work is shown, such as $6t + 30 + 8t - 60 = 180$.
[2] The student finds correctly the unknown, $t = 15$, but does not find the measure of angle 4.
or [2] Appropriate work is shown, but one computational error is made.
[1] The student forms an incorrect equation, such as setting the two angles equal, and arrives at $t = 45$ and an angle of 300.
or [1] 120, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[5]

[3] 95, and appropriate work is shown, such as $3x - 20 + x + 60 = 180$.
[2] Appropriate work is shown, but one computational error is made.
or [2] A correct equation is written and solved for x, but $m\angle ROY$ is not found.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made, such as writing the equation $x + 60 = 3x - 20$, but an appropriate answer is found.
or [1] A correct equation is written, but no further correct work is shown,
or [1] 95, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[6] incorrect procedure.

[7] A

[4] 112.5, and appropriate work is shown, such as solving the equation $5x - 20 = x + 50$.
[3] Appropriate work is shown, but one computational error is made.
or [3] $m\angle BED = 67.5$ or $m\angle AEC = 67.5$, but no further correct work is shown.
[2] Appropriate work is shown, but two or more computational errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, but an appropriate measure for $\angle CEB$ is found.
or [2] A correct equation is written and solved for x, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] 112.5, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[8] incorrect procedure.

[9] C

[10] A

[11] B

[12] B

[13] C

[14] C

[2] 75, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] An incorrect equation of equal difficulty, such as $x + 5x = 180$, is solved appropriately, and an appropriate angle measure is found.
or [1] A correct equation is written and solved for x, but no further correct work is shown.
or [1] 75, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously
[15] incorrect procedure.