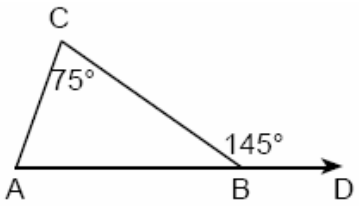
NAME:_____

G.G.32: Investigate, justify, and apply theorems about geometric inequalities, using the exterior angle theorem

1. 069912a, P.I. G.G.32

In the accompanying diagram of ΔABC, $\overline{AB}$ is extended to *D*, exterior angle *CBD* measures 145°, and $m\angle C = 75$.

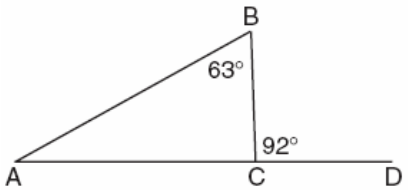


What is $m\angle CAB$?

[A] 35 [B] 70 [C] 110 [D] 220

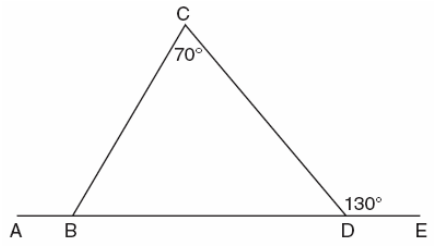
2. 080121a, P.I. G.G.32

Triangle *ABC*, with side $\overline{AC}$ extended to *D*, is shown in the accompanying diagram. If $m\angle ABC = 63$ and $m\angle BCD = 92$, what is $m\angle BAC$?



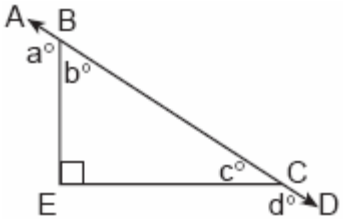
3. 060431a, P.I. G.G.32

In the accompanying diagram of ΔBCD, $m\angle C = 70$, $m\angle CDE = 130$, and side $\overline{BD}$ is extended to *A* and to *E*. Find $m\angle CBA$.



4. 010216a, P.I. G.G.32

In the accompanying diagram, $\overleftrightarrow{ABCD}$ is a straight line, and angle *E* in triangle *BEC* is a right angle.



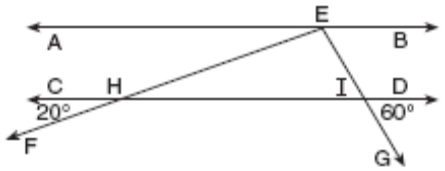
What does $a° + d°$ equal?

[A] 270° [B] 160°

[C] 135° [D] 180°

5. 060606a, P.I. G.G.32

In the accompanying diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$. From point *E* on $\overleftrightarrow{AB}$, transversals $\overrightarrow{EF}$ and $\overrightarrow{EG}$ are drawn, intersecting $\overleftrightarrow{CD}$ at *H* and *I*, respectively.



If $m\angle CHF = 20$ and $m\angle DIG = 60$, what is $m\angle HEI$?

[A] 80 [B] 100 [C] 120 [D] 60

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[1] B

[2] 29, and appropriate work is shown, such as 92 – 63 = 29.
[1] The correct application of the exterior angle theorem is shown, but one or more computational errors are made.
or [1] The correct application of supplementary angles and the sum of the angles of a triangle are shown, but one or more computational errors are made.
or [1] $m\angle BCA$ is calculated incorrectly, but the sum of the angles in a triangle is used appropriately.
or [1] 29, 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] 120, and appropriate work is shown, such as $m\angle CDB = 180 - 130 = 50$ and $m\angle CBA = 70 + 50 = 120$ or correctly labeled angles in a diagram.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] $m\angle CBD = 60$ is found, but no further correct work is shown.
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.
[3]

[4] A

[5] B