A.M.2: Solve problems involving conversions within measurement systems, given the relationship between the units.

1. 010901ia, P.I. A.M.2
On a certain day in Toronto, Canada, the temperature was 15° Celsius (C). Using the formula $F = \frac{9}{5}C + 32$, Peter converts this temperature to degrees Fahrenheit (F). Which temperature represents 15°C in degrees Fahrenheit?
[A] 35 [B] 59 [C] 85 [D] -9

2. 060021a, P.I. A.M.2
The formula for changing Celsius (C) temperature to Fahrenheit (F) temperature is $F = \frac{9}{5}C + 32$. Calculate, to the *nearest degree*, the Fahrenheit temperature when the Celsius temperature is -8.

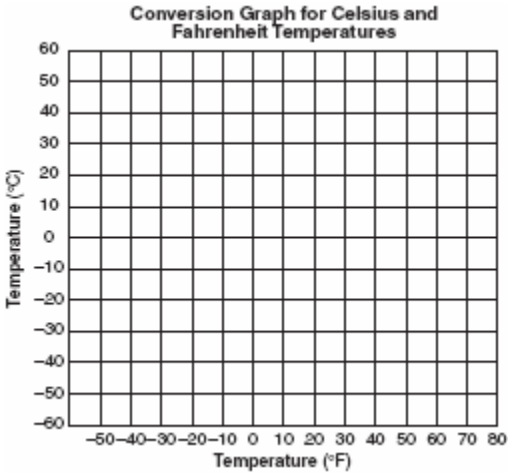
3. 080804a, P.I. A.M.2
The formula for converting temperatures in degrees Celsius to degrees Fahrenheit is $F = \frac{9}{5}C + 32$. If the temperature is 20°C, what is the temperature in degrees Fahrenheit?
[A] 4 [B] 43.1 [C] 68 [D] 33.8

4. 060407a, P.I. A.M.2
If the temperature in Buffalo is 23° Fahrenheit, what is the temperature in degrees Celsius? [Use the formula $C = \frac{5}{9}(F - 32)$.]
[A] 5 [B] 45 [C] -5 [D] -45

5. 089908a, P.I. A.M.2
The formula $C = \frac{5}{9}(F - 32)$ can be used to find the Celsius temperature (C) for a given Fahrenheit temperature (F). What Celsius temperature is equal to a Fahrenheit temperature of 77°?
[A] 8° [B] 171° [C] 25° [D] 45°

6. 010734a, P.I. A.M.2
The formula $C = \frac{5}{9}(F - 32)$ is used to convert Fahrenheit temperature, F, to Celsius temperature, C. What temperature, in degrees Fahrenheit, is equivalent to a temperature of 10° Celsius?

7. 060128a, P.I. A.M.2
Connor wants to compare Celsius and Fahrenheit temperatures by drawing a conversion graph. He knows that $-40°C = -40°F$ and that $20°C = 68°F$. On the accompanying grid, construct the conversion graph and, using the graph, determine the Celsius equivalent of 25°F.



8. 060709a, P.I. A.M.2
Andy is 6 feet tall. If 1 inch equals 2.54 centimeters, how tall is Andy, to the *nearest centimeter*?

[A] 30 [B] 183 [C] 15 [D] 213

9. 060731a, P.I. A.M.2
If a United States dollar is worth $1.41 in Canadian money, how much is $100 in Canadian money worth in United States money, to the *nearest cent*?

10. 060911ia, P.I. A.M.2
If the speed of sound is 344 meters per second, what is the approximate speed of sound, in meters per hour?

60 seconds = 1 minute
60 minutes = I hour

[A] 20,640 [B] 41,280
[C] 123,840 [D] 1,238,400

11. 080201a, P.I. A.M.2
On a map, 1 centimeter represents 40 kilometers. How many kilometers are represented by 8 centimeters?

[A] 320 [B] 48 [C] 5 [D] 280

12. 010818a, P.I. A.M.2
On a map, 1 inch represents 3 miles. How many miles long is a road that is $2\frac{1}{2}$ inches long on the map?

[A] $7\frac{1}{2}$ [B] $6\frac{1}{2}$ [C] $5\frac{1}{2}$ [D] $\frac{1}{2}$

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[1] B

[2] 18 and correct substitution, $F = \frac{9}{5}(-8) + 32$, is shown.
[1] A correct substitution method is shown, but one computational error is made.
or [1] The answer is not rounded to the nearest integer, such as 17.6 or 17 .
or [1] The student substitutes -8 for F, but then solves appropriately for C.
or [1] The student substitutes +8 for C, but then solves appropriately for F.
or [1] 18 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]

[3] C

[4] C

[5] C

[2] 50, and appropriate work is shown, such as solving the equation $10 = \frac{5}{9}(F - 32)$.
[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] Correct substitution is made into the equation, but no further correct work is shown.
or [1] 50, 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.

[6]

[3] A correct graph is shown, and an answer between -6° and -2° is found.
[2] A correct formula is used, and -4°C or an equivalent answer is found, but no graph is shown.
or [2] An appropriate graph is shown, and the correct answer is marked, but it is stated incorrectly, such as 5°C instead of -5°C.
or [2] An appropriate graph is shown, but answers outside the given range are found.
or [2] The line graph passes through at least one correct point, and an appropriate answer is found.
[1] The formula is used correctly, but the answer is not in the range, and no graph is shown.
or [1] An answer between -6° and -2° is found, but no graph is shown.
[0] A completely incorrect graph is shown.
or [0] No graph is shown and the formula is used incorrectly.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[7]

[8] B

[2] 70.92, and appropriate work is shown, such as a proportion.
[1] Appropriate work is shown, but one computational or rounding error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 70.92, 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.

[9]

[10] D

[11] A

[12] A