Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

Let y = temperature of an object in deg. F

z = temp. of same object in deg. C

Freezing point = 32 °F, 0 °C

Boiling Point = 212 °F, 100 °C

Celsius (z)	0	100
Fahrenheit (y)	32	212

$$\text{ROC} = \frac{\Delta y}{\Delta z} = \frac{212-32}{100-0} = \frac{180}{100} = 1.8$$

Celsius to Fahrenheit: $y = 1.8z + 32$

Fahrenheit to Celsius:

$$y = 1.8z + 32$$
$$-32 \qquad -32$$
$$\frac{y-32}{1.8} = \frac{1.8z}{1.8}$$

$$\frac{(y-32)}{1.8} = z$$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

y = Temp in °F

Z = Temp in °C

Temperature in °F(y) is equivalent to 9/5 of the Celsius Temperature (z) plus 32.

F° → C°

Take the F value and subtract 32 from it. Then take the answer you get and multiply it by 5/9 to get the C value.

C° → F

To convert from Celsius to Fahrenheit multiply 9/5 of the C value and add 32 to it. The amount gives you the value in °F.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

First, you ~~must~~ should find the relationship / ratio of °F to °C. I will use the slope formula to do so. Let (y, z) be the coordinate so that $(0, 32)$ and $(100, 212)$ are our points.

$$m = \frac{y_2 - y_1}{z_2 - z_1} = \frac{212-32}{100-0} = \frac{180}{100} = \boxed{\frac{9}{5}} \leftarrow \text{slope}$$

Using this slope, choose one point to plug into point slope form.

$$y - y_1 = m(z - z_1) \quad \text{Formula}$$

$$y - 212 = \frac{9}{5}(z - 100) \quad \text{Substitute slope \& either point}$$

$$y - 212 = \frac{9}{5}z - 180 \quad \text{Addition Prop.}$$

$$+212 \qquad\qquad +212$$

$$\boxed{y = \frac{9}{5}z + 32}$$

*This is the formula that would convert °C to °F.

To find the formula to convert °F to °C, solve for z.

$$y = \frac{9}{5}z + 32 \quad \text{subtract \& multiply by reciprocal}$$

$$-32 \qquad -32$$

$$\frac{5}{9}(y - 32) = \left(\frac{9}{5}z\right)\frac{5}{9}$$

$$\boxed{z = \frac{5}{9}y - \frac{160}{9}}$$

* This is the formula that would convert °F to °C.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

y = temp. F.

z = temp. C.

$z = \frac{5}{9}(y-32)$ $\quad y = \frac{9}{5}z + 32$

Example A: Freezing point

$32°F = 0°C$ (y) (z)

$y = \frac{9}{5}z + 32$

$32 = \frac{9}{5}(0) + 32$

$32 = 32$ ✓

$z = \frac{5}{9}(y-32)$

$0 = \frac{5}{9}(32-32)$

$0 = \frac{5}{9}(0)$

$0 = 0$ ✓

Example B: Boiling point

$212°F = 100°C$ (y) (z)

$y = \frac{9}{5}z + 32$

$212 = \frac{9}{5}(100) + 32$

$212 = \frac{900}{5} + 32$

$212 = 212$ ✓

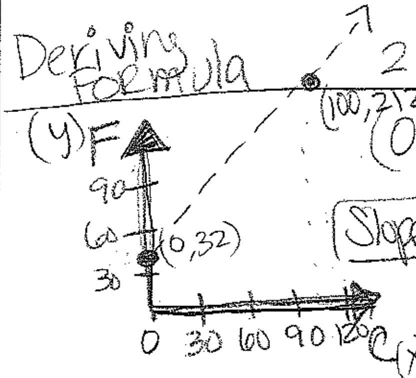
$z = \frac{5}{9}(y-32)$

$100 = \frac{5}{9}(212-32)$

$100 = \frac{5}{9}(180)$

$100 = 100$ ✓

Deriving Formula



(0, 32) (100, 212)

Slope → $\frac{212-32}{100-0} = \frac{180}{100} = \frac{18}{10} = \boxed{\frac{9}{5}}$

$y = mx + b$

$32 = \frac{9}{5}(0) + b$

$32 = b$ ✓

$y = \frac{9}{5}x + 32$

Then solve for C to get Celsius formula $\boxed{F = \frac{9}{5}C + 32}$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

Freezing pt of $H_2O \Rightarrow 32°F = 0°C$

Boiling pt of $H_2O \Rightarrow 212°F = 100°C$

Let y be the temp. of an object in °F

z be the temp of an object in °C

$$m = \frac{212-32}{100-0} = \frac{180}{100} = \frac{9}{5} \quad ; \quad b = 32$$

~~$y = \frac{9}{5}z + 32$~~

$$\boxed{y = \frac{9}{5}z + 32} \Rightarrow$$

For z:

$$y = \frac{9}{5}z + 32$$
$$-32 \qquad -32$$
$$\left[y - 32 = \frac{9}{5}z\right] \cdot \frac{5}{9}$$

$$\boxed{\frac{5}{9}(y-32) = z}$$

To convert a temperature in °C to °F

$$°C = \frac{5}{9}(F - 32)$$

To convert a temperature in °F to °C

$$°F = \frac{9}{5}C + 32$$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

Y Z
(F, C)
(32, 0)
(212, 100)

$$\frac{\Delta Y}{\Delta X} = \frac{100}{180} = \frac{10}{18} = \frac{5}{9}$$

$$z - 0 = \frac{5}{9}(Y - 32)$$

or

$$y - 32 = \frac{9}{5}(x - 0)$$

$$\Downarrow$$

$$Y = \frac{9}{5}x + 32$$

1) To convert C to F, multiply by $\frac{9}{5}$ then add 32.

2) To convert F to C, subtract 32 then multiply by $5/9$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

$y(f) = 32°$ freezing point
$f(z) = 0°$

Boiling point
$f(y) = 212$
$f(z) = 100°$

By Ratio

$100z = 180y + 32$

$\frac{z}{y} = \frac{100}{180 + 32}$

$100y = 180z + 32$

$y = \frac{180z}{100} + 32$

Thus: $y = 1.8z + 32$

$z = \frac{y - 32}{1.8}$

$f(y) = \frac{180z}{100} + 32$

$= 1.8z + 32$

$f(z) = \frac{y - 32}{1.8}$

$f(y) =$ ~~for~~ °K

$f(z) =$ ~~for~~ °C

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

Water freezes → 32°F → 0°C
Water boils → 212°F → 100°C

y is temp in °F
↕
z is temp in °C

* $y = \frac{9}{5}z + 32$
* $z = \frac{5}{9}(y-32)$

* To convert a temperature from Fahrenheit to Celsius, plug in the degrees Fahrenheit for y and solve by subtracting 32 and the multiplying by 5/9.

* To convert a temperature from Celsius to Fahrenheit, plug in the degrees Celsius for the z and solve by → multiplying by 9/5 then adding 32.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

y = temp in Fahrenheit & z = temp in Celsius

Let $y_1 = 32$ and $y_2 = 212$. Also, let $z_1 = 0$ & $z_2 = 100$. Then the rate of change is $m = \frac{212-32}{100-0} = \frac{180}{100} = \frac{18}{10} = \frac{9}{5}$ and $b = 32$.

Therefore, $y = \frac{9}{5}z + 32$ ① or $z = \frac{5}{9}(y-32)$ ②. To convert Fahrenheit to Celsius use equation ②. To convert Celsius to Fahrenheit degrees, use equation ①. For example, let $z = 100°C$. Converting to Fahrenheit yields

$$y = \frac{9}{5}(100) + 32 = 9 \cdot 20 + 32 = 180 + 32 = 212°F$$

Let $y = 32°F$, then converting to Celsius yields

$$z = \frac{5}{9}(32-32) = \frac{5}{9} \cdot 0 = 0°C.$$

Using the formulas ① and ②, we found the boiling point and freezing point stated in the problem.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

$y = {}^\circ F \quad z = {}^\circ C$

$y = \frac{9}{5} z + 32$ or $z = \frac{5}{9}(y - 32)$

You convert a temperature in °F to °C by subtracting 32, then multiplying the remainder by 5/9. For example, to convert 212°F to °C, you first subtract 212 - 32 to get 180, then multiply $180 \cdot \frac{5}{9}$ to get 100, which is the °C equivalent of 212°F.

To convert from °C to °F, just solve the equation $z = \frac{5}{9}(y - 32)$ for y (or °F) to obtain $y = \frac{9}{5} z + 32$. Again as an example, converting 100°C to °F requires you first to multiply $100 \cdot \frac{9}{5}$ (obtaining 180), then to add 32 to the product (resulting in 212 - the equivalent of 100°C in °F).

Proof for freezing point:

$y = 32;\ z = \frac{5}{9}(32 - 32)$ $\qquad$ $z = 0;\ y = \frac{9}{5}(0) + 32$

$z = \frac{5}{9}(0)$ $\qquad$ $y = 0 + 32$

$z = 0°C$ $\qquad$ $y = 32°F$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

$y = 1.8z + 32$ This is the linear equation converting Celsius to Fahrenheit. Since we know the freezing point of water is $32°F = 0°C$, and the boiling point is $100°C = 212°F$, we can find the slope of the line $y = mz + b$ as $m = \frac{212 - 32}{100 - 0} = \frac{180}{100} = 1.8$.

So $y = 1.8z + b$. Using the boiling point $(100, 212)$, we find $212 = 1.8(100) + b \Rightarrow 212 - 180 = b \Rightarrow b = 32$.

So $y = 1.8z + 32$.

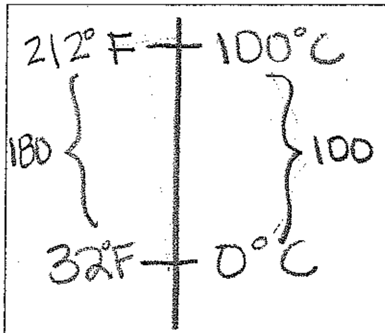
$z = \frac{y - 32}{1.8}$. This is simply a manipulation of $y = 1.8z + 32$.

To convert from Fahrenheit to Celsius, you plug in your temperature in degrees Fahrenheit for y and evaluate.

To convert from Celsius to Fahrenheit, you plug in your temperature in degrees Celsius for z in $y = 1.8z + 32$ and evaluate.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?



$\frac{F}{C} = \frac{180}{100} = 1.8$ is the ratio of F° to C°.

Y Z

$Y = 1.8Z + 32$ → use the ratio, but add 32 since F° starts at 32° for freezing when C° starts at 0°.

$F° = 1.8C° + 32$

$-32 \qquad -32$

$\frac{F° - 32}{1.8} = \frac{1.8C°}{1.8}$

$C° = \frac{F° - 32}{1.8}$ → $Z = \frac{Y - 32}{1.8}$

* Convert F° to C° by subtracting 32 since the F° scale starts at 32 when the C° starts at 0. Then divide by the ratio 1.8.
* Convert C° to F° by multiplying by the ratio 1.8 and then adding 32.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

The equations that relate y and Z are as follows

Let y = temperature in degrees Fahrenheit

Let Z = temperature in degrees Celsius

(0, 32) (0, 273) points on the line! (outside the box calculations for slope & eq. of line)

(100, 212) (32, 373)

$C(Z) = \frac{5}{9}(y - 32)$

$C(z) = \frac{5}{9}y - \frac{160}{9}$

linear equations — $\frac{5}{9}$ is the slope of the line and $-\frac{160}{9}$ is the y intercept

and $F(y) = \frac{9}{5}Z + 32$

and $\frac{9}{5}$ is the slope and 32 the y intercept

To convert a temperature in degrees Fahrenheit to degrees Celcius use: $F(y) = \frac{9}{5}Z + 32$ and solve for Z

To convert a temperature in degrees Celcius to degrees Fahrenheit use

$C(Z) = \frac{5}{9}(y - 32)$ and solve for y.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

Water Freezes @ 32° F ~ 0°C

Boils @ 212°F ~ 100°C

Know: $F = \frac{9}{5}C + 32$ need to derive this eqn.

y = temperature of an object in °F

z = temperature of same object in °C

Question: what eqn relate y & z? $\frac{9}{5}z + 32 = y$

How do you convert °F to °C? $°F = \frac{9}{5}°C + 32$

How do you convert °C to °F? $°C = \frac{5}{9}(°F - 32)$

Know from given:

a) y = 32 when z = 0

b) y = 212 when z = 100

$z + 32 = y$ if z = 0, y = 32 This fulfills part (a) of given. But does not fulfill part (b) of given.

$? z + 32 = 212$ So what times 100 and added to 32 will give 212 to fulfill part (b)?

$?(100) + 32 = 212$

$\quad -32 \quad -32$

$\frac{?(100)}{100} = \frac{180}{100}$

$? = \frac{9}{5}$ Therefore, the final equations has to be:

$$\frac{9}{5}z + 32 = y$$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write utside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

$y = {}^\circ F$

$z = {}^\circ C$

(C) $z = .56(y - 32)$

(F) $y = 1.8z + 32$

$K = z + 273$

Water freezes @ 32°F

$.56(32 - 32)$

$.56(0) = 0°C$

$0°C + 273 = 273°K$

Water Boils 212°F

$.56(212 - 32) = 100.8°C$

$100.8 + 273 = 373.8°K$

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

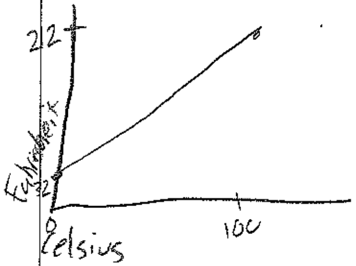
y= Fahrenheit degrees z= Celsius degrees

A) $y = \frac{9}{5} z + 32^\circ$ + B) $z = \frac{5}{9}(y - 32^\circ)$

A) To convert celsius to Fahrenheit, first multiply the Celsius degree by the faction 9/5. Then take that product and add 32° degrees to it.

B) To convert Fahrenheit to celsius, first subtract 32° from the given fahrenheit degree. Then multiply that number by 5/9

To get A) is used linear algebra. I made the x-axis = celsius degree and the y-axis = fahrenheit degree. Then I plotted the point for the boiling point of water, which is 100° Celsius, 212° fahrenheit. Then I plotted the point for the freezing point of water which is 0° Celsius, 32° fahrenheit. Next I found the equation of the line ($y = mx + b$). First the slope $m = \frac{y_1 - y_2}{x_1 - x_2}$. Using the given points boiling and freeze respectivly (100, 212), (0, 32)



$\frac{212-32}{100-0} = \frac{180}{100} = \frac{9}{5} = m$. Now using knowledge about $y = mx + b$, b is equal to the y-intercept. In other words when celsius is 0 what value does fahrenhiet have, looking at the graph the y-intercept is 32° which is b. Then pulling the new infomation into the equation of a line then $y = \frac{9}{5}x + 32$. Then relate the y and x axis to the given variables respectively the Fahrenheit = 9/5 Celsius + 32°

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

y = temp in °F f = freezing pt

z = temp in °C b = boiling pt

Relate the freezing pts: $y(f) = 32$, $z(f) = 0$

Relate the boiling pts: $y(b) = 212$, $z(b) = 100$

$212 - 32 = 180$

(1) $y(f) = z(f) + 32$

Using (1):

$y(b) = x \cdot z(f) + 32$

$212 = x \cdot 100 + 32$

$180 = x \cdot 100$

$1.8 = x$

$y(t) = 1.8\, z(t) + 32$ for some pt t. ⇒ $z(t) = \frac{y(t) - 32}{1.8}$

To convert from °F to °C, subtract 32 then divide by 1.8.

To convert from °C to °F, multiply by 1.8 then add 32.

Instructions. Always include explanations, so that other readers can tell what you did and why you did it. Never write outside the box.

Celsius-Fahrenheit. Water freezes at 32 degrees Fahrenheit and it boils at 212 degrees Fahrenheit. Water freezes at 0 degrees Celsius and it boils at 100 degrees Celsius. If y is the temperature of an object in degrees Fahrenheit and z is the temperature of the same object in degrees Celsius, then what equations relate y and z? How do you convert a temperature in degrees Fahrenheit to degrees Celsius? How do you convert a temperature in degrees Celsius to degrees Fahrenheit?

32° F freeze 0°C F → C ?
212° F boils 100°C C → F ?

$y = {}^\circ F$
$z = {}^\circ C$

Pick 2 points of form (z, y)

$(0, 32)$ $(100, 212)$

Find slope

$$\frac{212-32}{100-0} = \frac{180}{100} = \frac{9}{5}$$

$Y = \frac{9}{5}z + b$ (In terms of Fahrenheit)

$y = \frac{9}{5}z + 32$ y-intercept is 32.

In terms of Celsius just solve for z.

$y - 32 = \frac{9}{5}z$

$\frac{5}{9}(y-32) = z$