

Temperature Conversions

Name: KEY
Date: _____ Period: _____

Equations:

Celsius (C) to Fahrenheit (F)

$$F = (C \times 1.8) + 32$$

Fahrenheit to Celsius

$$C = (F - 32) \div 1.8$$

Celsius to Kelvin (K)

$$K = C + 273.15$$

Kelvin to Celsius

$$C = K - 273.15$$

	Freezing Temp.	Vaporization Temp.
1. Celsius	<u>0</u>	<u>100</u>
2. Fahrenheit	<u>32</u>	<u>212</u>
3. Kelvin	<u>273.15</u>	<u>373.15</u>

Use the space to show your work:

4. $25^{\circ}\text{C} = \underline{77}^{\circ}\text{F}$

12. $-40^{\circ}\text{C} = \underline{233.15}\text{K}$

5. $200^{\circ}\text{F} = \underline{366.48}\text{K}$

13. $25\text{K} = \underline{-248.15}^{\circ}\text{C}$

6. $-40^{\circ}\text{C} = \underline{-40}^{\circ}\text{F}$

14. $-2^{\circ}\text{F} = \underline{-18.88}^{\circ}\text{C}$

7. $25^{\circ}\text{F} = \underline{-3.88}^{\circ}\text{C}$

15. $800\text{K} = \underline{526.85}^{\circ}\text{C}$

8. $-140^{\circ}\text{C} = \underline{133.15}\text{K}$

16. $-20^{\circ}\text{C} = \underline{253.15}\text{K}$

9. $-40^{\circ}\text{F} = \underline{-40}^{\circ}\text{C}$

17. $1^{\circ}\text{C} = \underline{33.8}^{\circ}\text{F}$

10. $25^{\circ}\text{C} = \underline{298.15}\text{K}$

18. $97^{\circ}\text{C} = \underline{206.6}^{\circ}\text{F}$

11. $92^{\circ}\text{F} = \underline{33.33}^{\circ}\text{C}$

19. $300^{\circ}\text{K} = \underline{80.33}^{\circ}\text{F}$

~~★~~ see following pages for worked out problems

Temp. Conversions

Answer key

$$\begin{aligned} 4. \quad ^\circ\text{F} &= (^{\circ}\text{C} \times 1.8) + 32 \\ &= (25 \times 1.8) + 32 \\ &= 45 + 32 \\ &= 77^{\circ}\text{F} \end{aligned}$$

$$\begin{aligned} 12. \quad \text{K} &= ^{\circ}\text{C} + 273.15 \\ &= -40 + 273.15 \\ &= 233.15^{\circ}\text{K} \end{aligned}$$

$$\begin{aligned} 5. \quad ^\circ\text{C} &= (\text{F} - 32) \div 1.8 \\ \text{(2 steps)} &= (200 - 32) \div 1.8 \\ &= 168 \div 1.8 \\ &= 93.33^{\circ}\text{C} \end{aligned}$$

$$\begin{aligned} \text{K} &= \text{C} + 273.15 \\ &= 93.33 + 273.15 \\ &= 366.48^{\circ}\text{K} \end{aligned}$$

$$\begin{aligned} 13. \quad \text{C} &= \text{K} - 273.15 \\ &= 25 - 273.15 \\ &= -248.15^{\circ}\text{C} \end{aligned}$$

$$\begin{aligned} 6. \quad \text{F} &= (\text{C} \times 1.8) + 32 \\ &= (-40 \times 1.8) + 32 \\ &= -72 + 32 \\ &= -40^{\circ}\text{F} \end{aligned}$$

$$\begin{aligned} 14. \quad \text{C} &= (\text{F} - 32) \div 1.8 \\ &= (-2 - 32) \div 1.8 \\ &= -34 \div 1.8 \\ &= -18.88^{\circ}\text{C} \end{aligned}$$

$$\begin{aligned} 7. \quad \text{C} &= (\text{F} - 32) \div 1.8 \\ &= (25 - 32) \div 1.8 \\ &= -7 \div 1.8 \\ &= -3.88^{\circ}\text{C} \end{aligned}$$

$$\begin{aligned} 15. \quad \text{C} &= \text{K} - 273.15 \\ &= 800 - 273.15 \\ &= 526.85^{\circ}\text{C} \end{aligned}$$

$$\begin{aligned} 8. \quad \text{K} &= \text{C} + 273.15 \\ &= -140 + 273.15 \\ &= 133.15^{\circ}\text{K} \end{aligned}$$

$$\begin{aligned} 16. \quad \text{K} &= \text{C} + 273.15 \\ &= -20 + 273.15 \\ &= 253.15^{\circ}\text{K} \end{aligned}$$

$$\begin{aligned} 9. \quad \text{C} &= (\text{F} - 32) \div 1.8 \\ &= (-40 - 32) \div 1.8 \\ &= -72 \div 1.8 \\ &= -40^{\circ}\text{C} \end{aligned}$$

$$\begin{aligned} 17. \quad \text{F} &= (\text{C} \times 1.8) + 32 \\ &= (1 \times 1.8) + 32 \\ &= 1.8 + 32 \\ &= 33.8^{\circ}\text{F} \end{aligned}$$

$$\begin{aligned} 10. \quad \text{K} &= \text{C} + 273.15 \\ &= 25 + 273.15 \\ &= 298.15^{\circ}\text{K} \end{aligned}$$

$$\begin{aligned} 18. \quad F &= (C \times 1.8) + 32 \\ &= (97 \times 1.8) + 32 \\ &= 174.6 + 32 \\ &= 206.6^\circ\text{F} \end{aligned}$$

$$\begin{aligned} 11. \quad C &= (F - 32) \div 1.8 \\ &= (92 - 32) \div 1.8 \\ &= 60 \div 1.8 \\ &= 33.33^\circ\text{C} \end{aligned}$$

$$\begin{aligned} 19. \quad C &= K - 273.15 \\ \text{(2 steps)} &= 300 - 273.15 \\ &= 26.85^\circ\text{C} \end{aligned}$$

$$\begin{aligned} F &= (C \times 1.8) + 32 \\ &= (26.85 \times 1.8) + 32 \\ &= 48.33 + 32 \\ &= 80.33^\circ\text{F} \end{aligned}$$