



UiO : **University of Oslo**

## Miscellaneous Topics

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# Converting Air Temperatures 1

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- ▶ We will explore the simpler formula

$$c = \frac{1}{2}(f - 30).$$

# Converting Air Temperatures 2

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- ▶ When is this formula exact? We have

$$\frac{1}{2}(F - 30) = \frac{5}{9}(F - 32)$$

$$9(F - 30) = 10(F - 32)$$

$$320 - 270 = F$$

$$F = 50,$$

so 50°F gives 10°C with both formulas.

# Converting Air Temperatures 3



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- ▶ So if you are converting temperatures between  $30^{\circ}\text{C} = 10^{\circ}\text{C} + 2 \cdot 10^{\circ}\text{C}$  and  $-10^{\circ}\text{C} = 10^{\circ}\text{C} - 2 \cdot 10^{\circ}\text{C}$ , then the approximation formula will never be more than  $2^{\circ}\text{C}$  off.

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$$\frac{1}{2}f = \frac{5}{9}(f - 32)$$

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so  $320^{\circ}\text{F}$  gives  $160^{\circ}\text{C}$  with both formulas.

- ▶ The same argument as above, shows that if you are converting temperatures between  $60^{\circ}\text{C} = 160^{\circ}\text{C} - 10 \cdot 10^{\circ}\text{C}$  and  $260^{\circ}\text{C} = 160^{\circ}\text{C} + 10 \cdot 10^{\circ}\text{C}$ , the approximation formula will never be more than  $10^{\circ}\text{C}$  off.