



5. Mr. Wenzel leaves school in his truck along Loop 337 at time  $t = 0$  traveling at 45 mph.
- Write an expression  $d(t)$  for the distance Mr. Wenzel travels from school beginning at  $t = 0$  hours.
  - Graph  $y = d(t)$
  - What is the slope of the graph in part (b)? What does it have to do with the truck?
  - Create a scenario in which  $t$  could have negative values.
  - Create a scenario in which the  $y$ -intercept of  $y = d(t)$  could be 15.
  - Create a scenario in which there would NOT be an orange cone in the back of Mr. Wenzel's truck.

6. The tangent line to the graph of  $f(x) = 4x^2$  at  $x = -1$  has an equation  $y = -8x - 4$ .
- (a) Find the coordinate  $(x, f(x))$  of the point of tangency.
- (b) Find the equation of the normal line at this point.
- (c) Find the other coordinate where the normal line intersects the function  $f$ .
- (d) The tangent line of  $f$  at  $x = -1$  is used to approximate  $f(-2)$ . Find this approximation.
- (e) Is your approximation from part (d) an over or and under approximation of the true value of  $f(-2)$ ? Justify.

**Multiple Choice**

\_\_\_\_\_ 7. Which of the following is an equation of the line through  $(-3, 4)$  with a slope of  $\frac{1}{2}$ ?

(A)  $y - 4 = \frac{1}{2}(x + 3)$       (B)  $y + 3 = \frac{1}{2}(x - 4)$       (C)  $y - 4 = -2(x + 3)$

D)  $y - 4 = 2(x + 3)$       (E)  $y + 3 = 2(x - 4)$

\_\_\_\_\_ 8. Which of the following is an equation of the vertical line through  $(2, -4)$ ?

(A)  $y = -4$     (B)  $x = -2$     (C)  $y = 4$     (D)  $x = 0$     (E)  $x = 2$

\_\_\_\_\_ 9. Which of the following is the  $x$ -intercept of the line  $y = 2x - 5$ ?

(A)  $x = -5$     (B)  $x = 5$     (C)  $x = 0$     (D)  $x = \frac{5}{2}$     (E)  $x = -\frac{5}{2}$

\_\_\_\_\_ 10. Which of the following is an equation of the line through  $(-2, -1)$  parallel to the line  $y = -3x + 1$ ?

(A)  $y = -3x + 5$     (B)  $y = -3x - 7$     (C)  $y = \frac{1}{3}x - \frac{1}{3}$     (D)  $y = -3x + 1$     (E)  $y = -3x - 4$

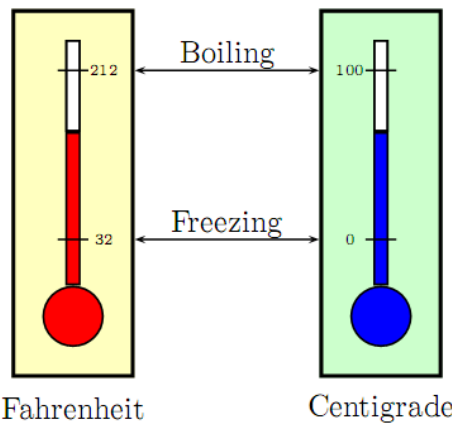
\_\_\_\_\_ 11. Find the  $x$ -intercept of the straight line passing through the point  $(4,5)$  and parallel to  $y+3x=1$ .

- (A)  $\frac{17}{4}$       (B) 6      (C)  $\frac{17}{3}$       (D)  $-\frac{7}{3}$       (E)  $-\frac{17}{3}$

\_\_\_\_\_ 12. Find the  $y$ -intercept of the straight line passing through the point  $(5,3)$  and perpendicular to  $y+2x=1$ .

- (A)  $-\frac{1}{2}$       (B)  $\frac{11}{2}$       (C)  $\frac{1}{2}$       (D) 0      (E)  $-\frac{11}{2}$

\_\_\_\_\_ 13. There is a linear relationship  $T_F = mT_C + b$  between the temperature  $T_F$  on the Fahrenheit scale and its equivalent  $T_C$  on the Centigrade scale. As the thermometers show, water freezes at  $32^\circ F$  and boils at  $212^\circ F$ , whereas it freezes at  $0^\circ C$  and boils at  $100^\circ C$ . Convert  $-5^\circ C$  to its Fahrenheit equivalent.



- (A)  $\approx 23^\circ F$       (B)  $\approx 24^\circ F$       (C)  $\approx 20^\circ F$       (D)  $\approx 22^\circ F$       (E)  $\approx 21^\circ F$