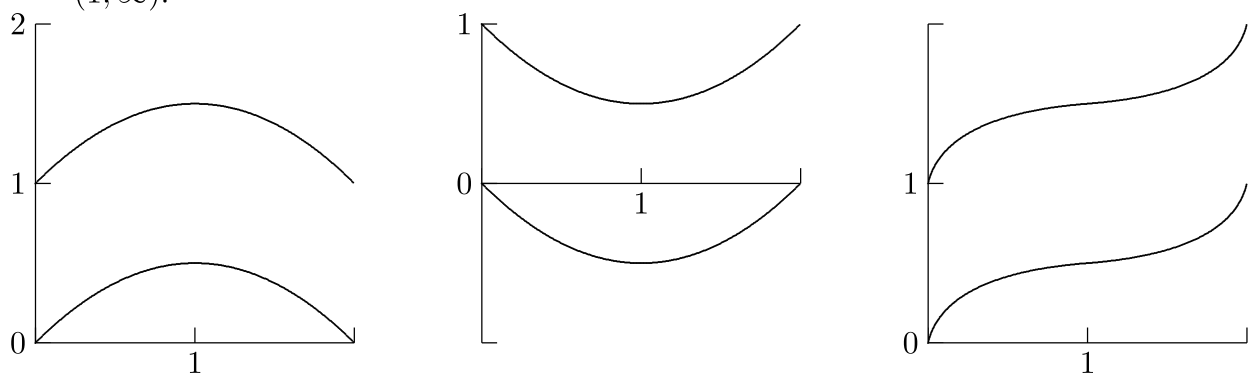
6.2, #4. $|x|$ is non-negative, so $\int_{-1}^{1} |x|\, dx$ is the area of two triangles: the first has sides on the lines $y = -x$, $x = -1$, $y = 0$; the second has sides on the lines $y = x$, $x = 1$, $y = 0$. Clearly $\int_{-1}^{1} |x|\, dx = 1$

6.2, #5. a) $\frac{1}{\sqrt{2\pi}} \int_1^3 e^{-\frac{x^2}{2}}\, dx = \frac{1}{\sqrt{2\pi}} \int_0^3 e^{-\frac{x^2}{2}}\, dx -$
$\frac{1}{\sqrt{2\pi}} \int_0^1 e^{-\frac{x^2}{2}}\, dx = 0.4987 - 0.3413 = 0.1574.$
b) $\frac{1}{\sqrt{2\pi}} \int_{-2}^3 e^{-\frac{x^2}{2}}\, dx = \frac{1}{\sqrt{2\pi}} \int_{-2}^0 e^{-\frac{x^2}{2}}\, dx + \frac{1}{\sqrt{2\pi}} \int_0^3 e^{-\frac{x^2}{2}}\, dx$
$= \frac{1}{\sqrt{2\pi}} \int_0^2 e^{-\frac{x^2}{2}}\, dx + \frac{1}{\sqrt{2\pi}} \int_0^3 e^{-\frac{x^2}{2}}\, dx = 0.4772 + 0.4987 = 0.9759.$

6.3, #2. $F'(x) = f(x)$ is negative on $[0, 1]$ and positive on $[1, \infty)$,
so $F(x)$ is decreasing on $(0, 1)$ and increasing on $(1, \infty)$.
$F''(x) = f'(x) = 1$ is always positive, $F(x)$ is concave up on $[0, \infty)$.

6.3, #3. $F'(x) = f(x)$ is positive on $[0, \infty)$,
so $F(x)$ is increasing on $[1, \infty)$.
$F''(x) = f'(x)$ is -1 on $[0, 1)$ and 1 on $(1, \infty)$. So $F(x)$ is concave-down on $(0, 1)$ and concave-up $(1, \infty)$.



6.3, #6 $F'(x) = f(x) > 0$ for $x > 0$ so $F(x)$ is increasing. $F'(x) = f(x)$ is also increasing so the graph of $y = F(x)$ is concave up.

6.3, #11. The cork is oscillating relative to the sea floor. Its position above the sea floor is the signed area bounded by the velocity graph. So at point B the cork is at its crest, at point D the cork is at its trough. At points A and C the cork is halfway between its crest and its trough. The acceleration is zero at points A and C, where the tangent line to the velocity graph is horizontal. The function giving the position of the cork above the sea floor has form $-\cos t + C$ for some constant C.