p 234 q11

11. Sketch the graph of each function over the interval $[-360°, 360°]$. For each function, clearly label the maximum and minimum values, the x-intercepts, the y-intercept, the period, and the range.

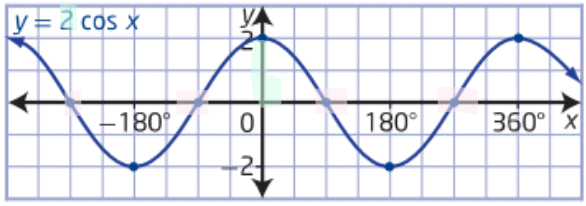
a) $y = 2 \cos x$ **b)** $y = -3 \sin x$

c) $y = \frac{1}{2} \sin x$ **d)** $y = -\frac{3}{4} \cos x$

b/c there is no H stretch:
the period does not change
the x-intercepts do not change

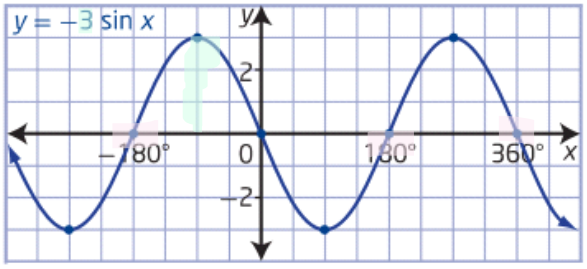
the only thing changed here is the curvature of the function b/c of the vertical stretch
and there are reflections, but they pass through the same x-intercepts as before

11. a)



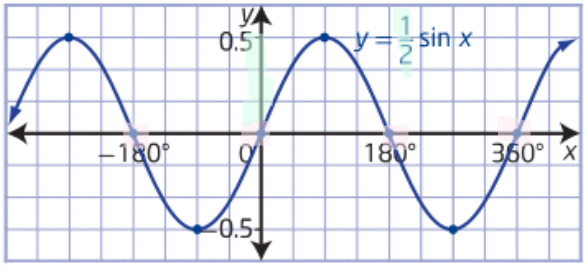
Property	Points on the Graph of $y = 2 \cos x$
maximum	$(-360°, 2), (0°, 2), (360°, 2)$
minimum	$(-180°, -2), (180°, -2)$
x-intercepts	$(-270°, 0), (-90°, 0), (90°, 0), (270°, 0)$
y-intercept	$(0, 2)$
period	$360°$
range	$\{y \mid -2 \le y \le 2, y \in R\}$

b)



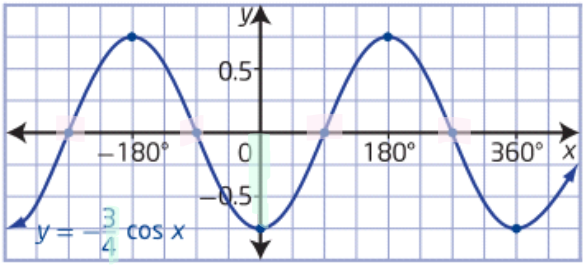
Property	Points on the Graph of $y = -3 \sin x$
maximum	$(-90°, 3), (270°, 3)$
minimum	$(-270°, -3), (90°, -3)$
x-intercepts	$(-360°, 0), (-180°, 0), (0°, 0), (180°, 0), (360°, 0)$
y-intercept	$(0, 0)$
period	$360°$
range	$\{y \mid -3 \le y \le 3, y \in R\}$

c)



Property	Points on the Graph of $y = \frac{1}{2} \sin x$
maximum	$(-270°, 0.5), (90°, 0.5)$
minimum	$(-90°, -0.5), (270°, -0.5)$
x-intercepts	$(-360°, 0), (-180°, 0), (0°, 0), (180°, 0), (360°, 0)$
y-intercept	$(0, 0)$
period	$360°$
range	$\{y \mid -0.5 \le y \le 0.5, y \in R\}$

d)



Property	Points on the Graph of $y = -\frac{3}{4} \cos x$
maximum	$(-180°, 0.75), (180°, 0.75)$
minimum	$(-360°, -0.75), (0°, -0.75), (360°, -0.75)$
x-intercepts	$(-270°, 0), (-90°, 0), (90°, 0), (270°, 0)$
y-intercept	$(0, -0.75)$
period	$360°$
range	$\{y \mid -0.75 \le y \le 0.75, y \in R\}$