Math 118 Fall 2022 Common Final Version A Answers:
Version A Answers:

1. (a) $P(t) = 20t + 1200$
   (b) $P(t) = 1200(1.15)^t$
   (c) $P(t) = 1200e^{0.140t}$
   (d) $t \approx 9.9$, so 2032
2. (a) \$8103.38
   (b) \$8132.25
   (c) \$8132.84
3. $r = 9.816\%$
4. 3.985 years
5. (a) amplitude is 9, period is 12, midline is $y = 13$
   (b) $P = -9\cos(\frac{\pi}{6}t) + 13$
   (c) omitted
6. $-0.6, 0.6, 3.4, 4.6$
7. (a) $\frac{\sqrt{19}}{\sqrt{35}}$
   (b) $\frac{-4}{\sqrt{19}}$
8. (a) omitted
   (b) 17.663
   (c) 19.824
9. $b = 7.3$, $\psi = 33.2^\circ$, $\theta = 116.8^\circ$ [don't be too strict on the rounding]
10. (a) $(\sqrt{32}, \frac{\pi}{4})$
    (b) $(\frac{3\sqrt{3}}{2}, \frac{3}{2})$
11. (a) $800(1.062)^{20} \approx 2664$. There are 2664 Math 118 students in 2040
    (b) $\frac{\ln(\frac{P}{800})}{\ln(1.062)}$ or $\frac{\log(\frac{P}{800})}{\log(1.062)}$
    (c) 12. In 2032, the number of Math 118 students is 1600.
12. There are many possible combinations, such as $u(x) = \frac{15}{\sqrt{x}}$ and $v(x) = x - 4$
13. (a) $-\infty$
    (b) ∞