

Math 118 Common Final Rubric for both versions

In general, I am not too strict on rounding (unless it's a problem like number 8). If you are going to take off points for rounding errors, I would suggest not making it too many points.

1. (a) 1.5 points for correct slope. 1.5 points for correct y -intercept
(b) 1.5 points for correct initial value. 1.5 points for correct growth factor
(c) 1.5 points for correct setup, 1 point for correct value for t , 0.5 points for giving correct year
2. (a) 2 points for setting up formula. 1 point for correct answer
(b) 2 points for setting up formula. 1 point for correct answer
(c) 2 points for setting up formula. 1 point for correct answer
3. (a) 1 point for each of the values
(b) 2 points for the correct value for k , and 1 point for writing the function in the new form
(c) 1 point for selecting decay
4. 1.5 points for the domain and 1.5 points for the range
5. 3 points for correct setup, 3 points for process that leads to the correct answer
6. (a) If $y = A \cos(Bt) + k$, 1 point for A , 1 point for identifying that it is cosine, 1 point for B and 1 point for k
(b) 1 point for setting up initial equation. 2 points for solving for t and 1 point for evaluating.
7. If $y = A \cos(Bt) + k$, 2 points for A , 2 points for identifying that it is cosine, 2 points for B and 2 points for k
8. 3 points per part
9. 1.5 points for the first identity, 1.5 for the second identity, 1.5 points for the third identity, and 1.5 points for putting it all together/determining it is true
10. 6 points
11. (a) 2 points for correct value, 1 point for explanation
(b) 3 points
(c) 2 points for correct value, 1 point for explanation
12. 4 points per part
13. 3 points for each missing side/angle

Version A Answers:

1. (a) $P = 100t + 1500$
(b) $P = 1500(1.16)^t$
(c) $t \approx 8$, so 2031
2. (a) \$9380.67
(b) \$9431.46
(c) \$9449.01
3. (a) Initial value is 4.2. Growth factor is 0.182. Growth rate is -0.818
(b) $4.2e^{-1.70t}$
(c) decay
4. The domain is all real numbers. The range is all positive numbers
5. $t \approx 8.66$ hours
6. (a) $y = 4.6 \cos\left(\frac{2\pi}{13}t\right) + 5$
(b) $t = \frac{13 \cos^{-1}\left(\frac{2}{4.6}\right)}{2\pi}$, $t \approx 2.32$ hours after midnight
7. $y = 2 \cos(\pi t) + 1$
8. (a) $\frac{4}{5}$
(b) $\frac{\sqrt{45}}{7}$
(c) $\frac{-6 + 4\sqrt{45}}{35}$
(d) $\frac{-8 - 3\sqrt{45}}{35}$
9. Yes, it is true
10. $x \approx 0.35$ miles
11. (a) 3291. This is the population of the town in 2026
(b) $\frac{\ln\left(\frac{P}{600}\right)}{\ln(1.328)}$
(c) $t \approx 4$. In 2024, the population will hit 2000
12. (a) 11
(b) $\ln(6x - 13)$
13. $a = 14.52$, $B = 29.25^\circ$, $C = 19.75^\circ$

Version B Answers:

1. (a) $P = 200t + 1600$
(b) $P = 1600(1.12)^t$
(c) $t \approx 10$, so 2033
2. (a) \$9004.38
(b) \$9098.66
(c) \$9131.77
3. (a) Initial value is 2.1. Growth factor is 0.364. Growth rate is -0.636
(b) $2.1e^{-1.01t}$
(c) decay
4. The domain is all real numbers. The range is all positive numbers
5. $t \approx 11.55$ hours
6. (a) $y = 2.1 \cos\left(\frac{2\pi}{13}t\right) + 3.5$
(b) $t = \frac{13 \cos^{-1}\left(\frac{0.5}{2.1}\right)}{2\pi}$, $t \approx 2.75$ hours after midnight
7. $y = 2 \cos(\pi t) + 1$
8. (a) $\frac{3}{5}$
(b) $\frac{\sqrt{77}}{9}$
(c) $\frac{-8 + 3\sqrt{77}}{45}$
(d) $\frac{-6 - 4\sqrt{77}}{45}$
9. Yes, it is true
10. $x \approx 0.35$ miles
11. (a) 1871. This is the population of the town in 2026
(b) $\frac{\ln\left(\frac{P}{500}\right)}{\ln(1.246)}$
(c) $t \approx 6$. In 2026, the population will hit 2000
12. (a) 37
(b) $\ln(18x - 17)$
13. $a = 14.52$, $B = 29.25^\circ$, $C = 19.75^\circ$