

Final Exam Review #1
Practice Problems from mostly Ch 5-7 ,

Do these questions on separate paper and then check your answers on the back.

1. Solve the following equations (show work. Keep answers exact)

(a) $2|x - 3| + 7 = 11$ (b) $x = 1 + \sqrt{2x - 3}$ (c) $4(x - 2)^2 = 16$ (d) $\frac{3}{4}x^2 = \frac{5}{4}x + \frac{1}{2}$

(e) $5x^3 = 75$ (f) $85 = 5(3)^{x-1}$ (g) $-2 = \log_2(x + 1)$ (h) $\log_3 x - \log_3 7 = 4$

2. Solve the quadratic eqn using **completing the square**: (a) $x^2 - 4x + 20 = 0$ and the challenging (b) $2x^2 - 3x - 2 = 0$
If complex, write solution in $a + bi$ form

3. Find the exact value of $\cos \frac{5\pi}{6}$ $\sin 2\pi$ $\tan \left(-\frac{7\pi}{4}\right)$ without a calculator

4. Find the inverse of $t(x) = 2\sqrt{x + 1} + 3$ $h(x) = \frac{2}{x-1} + 3$ $g(x) = 3^x + 2$

5. Compositions: Given $f(x) = 2x^2 - 4$ and $g(x) = 5x + 3$, find $f(g(x))$ and find $g(f(-5))$,
and simplify

6. Calculate the future value of \$20,500 after 15 years if you invest it in a bank that pays 7.3% *annual interest* but compounds the interest monthly.

7. Solve the system of equations:

a. $9x + 3y + z = 10$
b. $25x + 5y + z = 36$
c. $4x - 2y + z = 15$

hint to start: remember to use two pairs of equation and eliminate the same variable in both pairs.

8. and one more from Ch. 8

Create a polynomial function in standard form given two of the roots: 2 and $4 + 7i$

9. Determine a possible Equation for each of the Graphs A, B, C, and D on the back side. Without a calculator. *Hint: Always draw the midline first.*

Answers to Practice
Practice Problems ---- Ch 5-7

1a) $x=5$ and $x=1$

1b) $x=2$

1c) $x=0$ and $x=4$

1d) $x = -\frac{1}{3}$ and $x = 2$

1e) $\sqrt[3]{15}$ is the exact answer

1f) $\frac{\log 17}{\log 3} + 1 \approx 3.579$ to 3 decimal places

1g) $x = -\frac{3}{4}$

1h) $x = 70000$

2) a) $x = 2 \pm 4i$ b) $x = 2$ and $x = -\frac{1}{2}$

3) $\cos \frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$ $\sin 2\pi = 0$ $\tan \frac{7\pi}{4} = -1$

4) $t^{-1}(x) = \left(\frac{x-3}{2}\right)^2 - 1$ $h^{-1}(x) = \frac{2}{x-3} + 1$ $g^{-1}(x) = \log_3(x+2)$

5) $f(g(x)) = 50x^2 + 60x + 14$ $g(f(-5)) = 233$

6) \$61,075.31

7) $x=2, y=-3, z=1$

8) $(x-2)(x^2 - 8x + 65)$ (in factored form), $x^3 - 10x^2 + 81x - 130$ (standard form)

9) Graph A possibilities: $y = 2\sin(2\theta) + 1$

Graph B possibilities: $y = -3\sin(t) + 2$ or $y = 3\cos(t - 270) + 2$

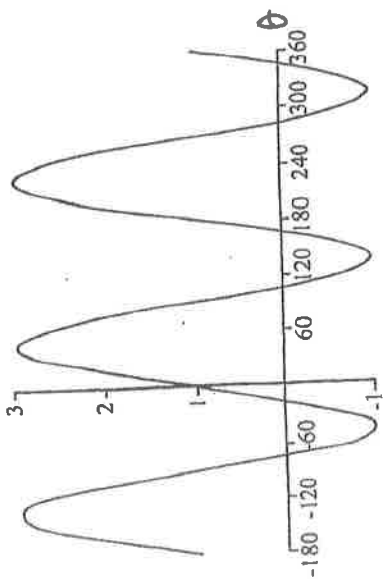
or $y = 3\cos(t + 90)$

Graph C possibilities: $y = -2\cos\left(\frac{\pi}{12}t\right) + 20$ if you like radians better or Type equation here.

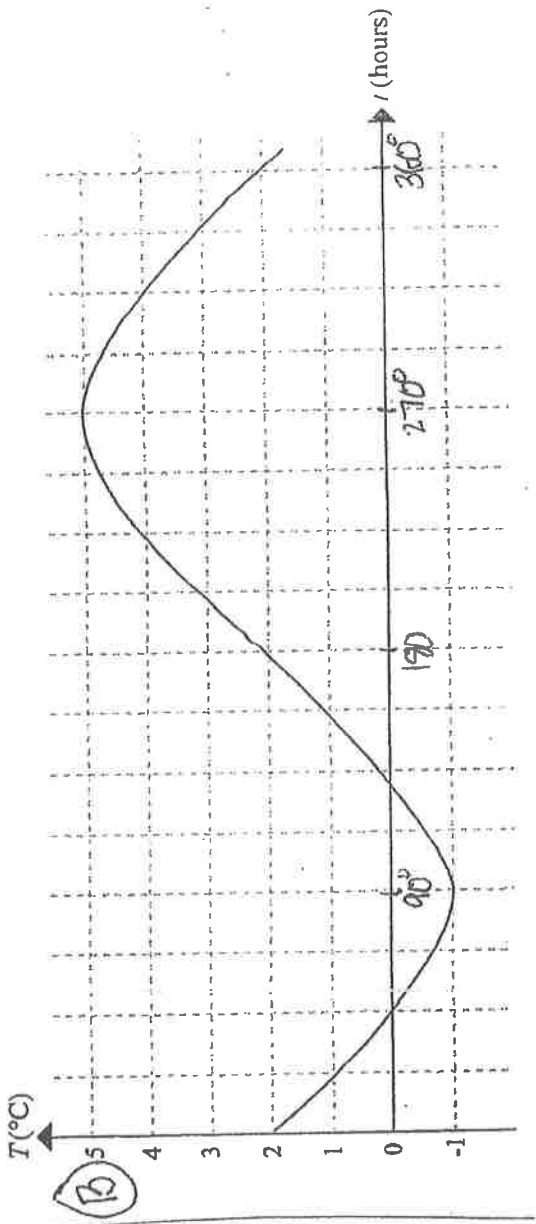
Or $y = -2\cos(15t) + 20$ if you like degrees better

Graph D possibilities: $y = 2\cos\left(\frac{\pi}{12}t\right) - 3$ if you like radians or...

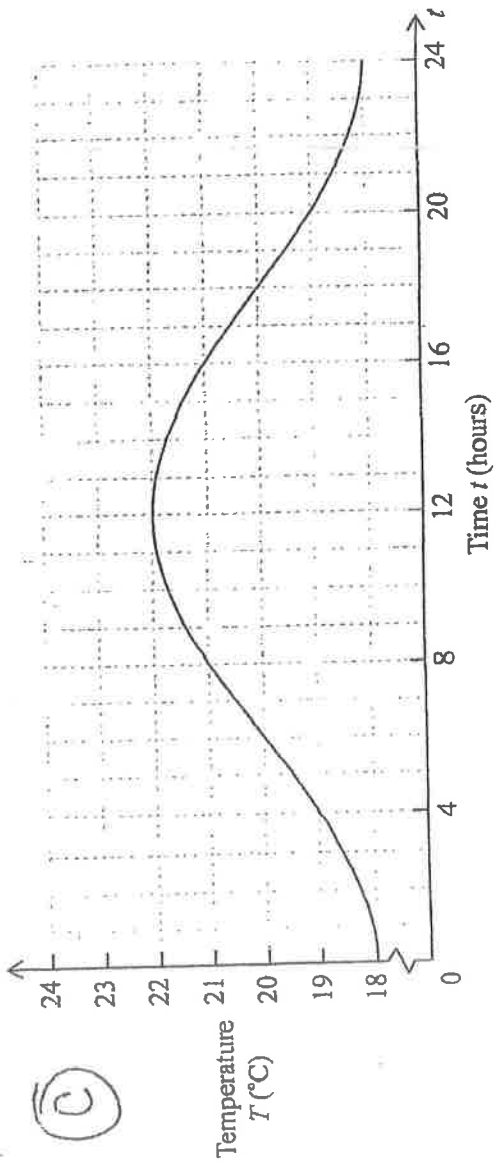
$y = 2\cos(15t) - 3$



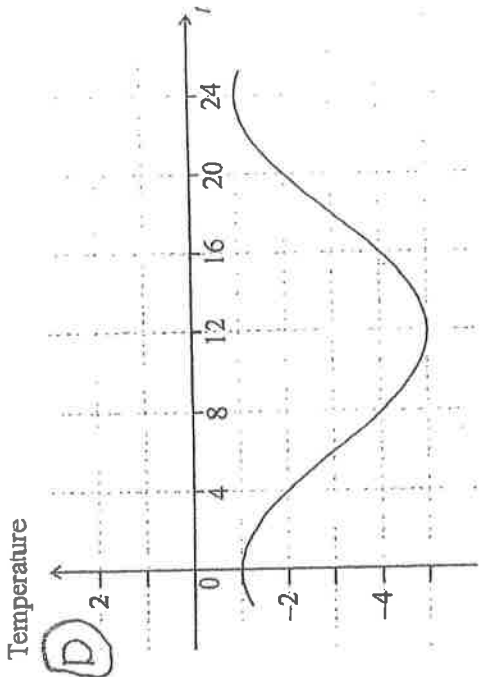
(A)



(B)



(C)



(D)

ON C and D:
 could use $\text{Per} = \frac{2\pi}{b}$ or $\text{Per} = \frac{360}{b}$
 would give you slightly different equations, both correct