1. Put $y + 6x = 5x^2 - 4x + 17$ into vertex form. What's the axis of symmetry? Determine whether y has a max or min value and find it.

2. Use completing the square to find the vertex form of $y = 6x^2 + 156x + 1014$. What's the axis of symmetry? Does the quadratic has a max or min? Find it.

3. Suppose you have exactly 300 feet of fencing and you wish to enclose a rectangular area using a river as one side (so only three sides of fencing will be used). What's the dimensions which give the maximum area enclosable and what's the maximum area?

4. Find an angle ϕ between 0° and 360° with $\cos(\phi) = \cos(-170^\circ)$.

5. Find the coordinates of the point on a circle centered at the origin of radius 15 determined by an angle of $-2\pi/13$ radians.

6. Find the coordinates of the point on a circle centered at the origin of radius 3π determined by an angle of 42°.

7. Find the radius of circle in which an angle of measure 30° determines an arc length of 27.

8. What's the measure in degrees of the angle determined by an arc of length 5π feet on a circle of radius 3?

9. Find an angle $\theta \neq 61^\circ$ with θ between 0° and 360° such that $\sin(\theta) = \sin(61^\circ)$.

10. Convert -12 radians into degress and convert pi° into radians.

11. State the phase shift and horizontal shift of $y = 14\sin(17x - 4) + 2$.

12. What fraction of the original period has $\cos(5(x - 4)) + 6$ been shifted from $\cos(5x)$?

13. See problems 2-8 in section 6.1.

14. Find the exact values of $\sin\left(\frac{11\pi}{6}\right)$ and $\cos\left(-\frac{5\pi}{4}\right)$ by relating these values to the sine and cosine of angles in the first quadrant.

15. Determine a formula for the sinusoidal function in figure 6.95 on page 284. Sate the midline, period, amplitude, and angular frequency first.

16. Do problem 16 on page 283.

17. Find a formula for the quadratic function f with vertex $(2, 4)$ and y-interecpt 7.

18. Find the formula for the quadratic with x-interecpts $(-3, 0)$, $(5, 0)$ which passes through the point $(-1, -6)$.

19. If $\sin\theta = 3$ and $\pi/2 \leq \theta \leq \pi$, what's $\sec\theta$ and $\tan\theta$?

20. Find all solutions θ exactly in radians to $\sin\theta = -\sqrt{2}/2$ with θ between 0 and 2π.

21. Find an exact solution ϕ in degrees to $\cos\phi = -\sqrt{3}/2$.

22. Find solutions using inverse trigonometric functions to $2\sin\theta = -.3$, $\cos(3\phi) = 1/7$ and $\tan(\psi - 4) = .85$.

23. See problems 1-2 and 9-10 in section 6.1.

24. Show that $\cot^2\theta + 1 = \csc^2\theta$ and $\cos^2\theta\sin^2\theta + \cos^4\theta + \sin^2\theta = 1$.

25. Find the reference angles of $11\pi/6$, $13\pi/4$, $-20°$, and $1400°$.

26. Find all solutions of $\sin\theta = -1/3$ for $0 \leq \theta \leq 2\pi$.

27. Suppose $\cos\phi = 1 - y^2$ with ϕ in the third quadrant. Find $\sin\phi$ and $\tan\phi$ in terms of y.

28. See problems 5-16 on pages 291-292.