Multiple choice.

1d	38c
2a	39c
3a	40e(4)
4e(246 degrees)	41a
5b	42c
6c	43e(2/3 right)
7d	44d
8e	45d
9a	46c
10d	47e(2pi/3)
11b	48a
12a	49d
13c	50c
14a	51a
15b	52d
16a	53d
17a	54c
18b	55b
19b	56b
20c	
21a	
22a	
23c	
24b	
25e(4.91ft)	
26c	
27e(t/m)	
28b	
29c	
30c	
31a	
32a	
33c	
34e($-4,-\sqrt{65}$)	
35c	
36c	
37c	

Partial credit

2. x = 7.28 cm, y = 47.67 cm

3. x = 6.45 cm, $\theta = 57.19°$

4. x = 8.31 cm, $\alpha = 27.92°$

5. $\sin x = \dfrac{-\sqrt{5}}{3}$, $\csc x = \dfrac{-3}{\sqrt{5}}$, $\tan x = \dfrac{-\sqrt{5}}{2}$

6. a) On the unit circle (centered at the origin) start at the point (1,0) and travel along the circle x units (clockwise, if x is positive). Stop at the point (a,b). By definition, sin x = b.

After traveling one complete cycle around the circle, the values Of b will repeat in the same order, so sin x is periodic.

b) On the unit circle, etc. tan x = b/a.

As a approaches 0, b/a increases or decreases without bound.

The value of a is 0 at x = $\dfrac{\pi}{2}, \dfrac{3\pi}{2}$ and $2k\pi$ plus these values (k any integer). Theses give us the x values of the vertical asymptotes.

c) On the unit circle, etc. cos x = a.

As long as we stay on the unit circle, the horizontal coordinate (a) will stay between -1 and 1, inclusive.

7. $\cos (2x) = \cos(x+x) = (\cos x)(\cos x) - (\sin x)(\sin x) = \cos^2 x - \sin^2 x$.

8.,9. $\dfrac{(\sqrt{3})-1}{2\sqrt{2}}$

10. x = 1.49, 3.72, 6.70, 9.01 (approximately)

11. x = -5.89, 9.82, 25.53, 41.24 (approximately)

12. x = .96, 5.11 (app)

13. a = -1/2, b = $\sqrt{3}/2$

14. a = - $\sqrt{3}/2$, b = -1/2

15. a = b = -1/$\sqrt{2}$

16. a) y = 2 + 4 cos(($\pi/4$)(x-6))   others possible

b) y = 200 + 100 sin(5πx)   others possible

17a) - $\pi/6$

b) .5

c) 1

d) $\sqrt{1-x^2}$

e) $\dfrac{x}{\sqrt{1-x^2}}$

18a) $y = 4 + 2 \cos ((\pi/2)x)$ others possible

b) $y = \tan (.5x)$ others possible

c) $y = -7 -3 \cos (\pi x)$ others possible

19a) 24

b) 6, 14, 22   others possible

c) 4, 8, 12   others possible

d) $y = 21 + 3 \sin((\pi/4)(x-4))$ others possible

20 all angles are in degrees

a) A = 44.42, B = 57.12, C = 7.46

b) A = 7.44, B = 14.06, C = 158.57

c) A = 39.37, B = 62.63, c = 7.71 ft

d) A = 44.78, C = 110.22, c = 13.32 m and A = 135.22, C = 19.78, c = 4. m

e) A = 2.55, C = 116.45, c = 9.37 cm

f) C = 90, a = 3.86 ft, b = 4.6 ft

21b), c) x = 2 (app), (QII), x = 4.3 (app), QIII

22 b), c) x = 3.9, (QIII), x = 5.5, (QIV)

23a) 16, 8, 4 others possible

b) 16. Two average values are at least ½ a period apart. These two are 8 units apart, so the largest possible period is 2(8) = 16.