Math 111, answers to review problems

Multiple choice.

1d
2a
3a
4e(246 degrees)
5b
6c
7d
8e
9a
10d
11b
12a
13c
14a
15b
16a
17a
18b
19b
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
38c
39c
40e(4)
41a
42c
43e(2/3 right)
44d
45d
46c
47e(2pi/3)
48a
49d
50c
51a
52d
53d
54c
55b
56b

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 = $\frac{-\sqrt{5}}{3}$, csc x = $\frac{-3}{\sqrt{5}}$, tan x = $\frac{-\sqrt{5}}{2}$

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 = $\frac{\pi}{2}, \frac{3\pi}{2}$ 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. $\frac{(\sqrt{3})-1}{2\sqrt{2}}$

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((π/4)(x-6)) others possible

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

17a) -π/6

b) .5

c) 1

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

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

18a) $y = 4 + 2 \cos ((\pi/2)x)$ others possible
b) $y = \tan (.5x)$ others possible
c) $y = -3\sin (\pi x) - 10$ 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.