

39 problems
(review #31, and
p778, #34 & 38 worth
2 points)

Score /42

Algebra 2 - Assignment 52 Key

NEW

1. $\widehat{AB} = \frac{\pi}{2}(12) = 6\pi$ inches

2. $\widehat{FGH} = \frac{3\pi}{4}(3) = \frac{9\pi}{4}$ m

3. $\widehat{ADB} = 18\left(\frac{2\pi}{4} - \frac{3\pi}{4}\right) = 18\left(\frac{5\pi}{4}\right) = \frac{45\pi}{2}$ cm

4. $8\left(\frac{\pi}{4}\right) = 2\pi$ inches

5. $\frac{3}{27}\left(\frac{11\pi}{9}\right) = 33\pi$ yds

6. $6(2) = 12$ m

7. $8 = 2\theta$ $\theta = 4$

8. $4 = 7\theta$ $\theta = \frac{4}{7}$

9. $16 = 24\theta$ $\theta = \frac{16}{24} = \frac{2}{3}$

10. $\frac{1}{2}r^2\theta = \frac{1}{2}(3^2)\left(\frac{\pi}{4}\right) = \frac{9\pi}{8}$ m²

11. $\frac{1}{2}(6)^2\frac{2\pi}{3} = \frac{36\pi}{3} = 12\pi$ cm²

12. $\frac{1}{2} \cdot \frac{\pi}{3} (20)^2 = \frac{400\pi}{3} = \frac{200\pi}{3}$ cm²

13. $\frac{1}{2}\left(\frac{\pi}{2}\right)4^2 = \frac{16\pi}{4} = 4\pi$

14. $\frac{1}{2}\left(\frac{\pi}{3}\right)5^2 = \frac{25\pi}{6}$

15. $\frac{1}{2}\left(\pi - \frac{\pi}{3}\right)5^2 = \frac{1}{2}\left(\frac{2\pi}{3}\right)25 = \frac{25\pi}{3}$

$$16. \frac{1}{2}(\pi)^2 = \frac{\pi}{2}$$

REVIEW

$$17. \frac{|x+14| + 3 > 17}{-3 \quad -3}$$

$$|x+14| > 14$$

$$\frac{x+14 > 14}{-14 \quad -14} \quad \text{OR} \quad \frac{x+14 < -14}{-14 \quad -14}$$

$$x > 0 \quad \text{OR} \quad x < -28$$

$$18. f(x) = x^2, h(x) = x-1$$

$$(h \circ f)(3) = (3)^2 - 1 = 9 - 1 = 8$$

$$19. 6^{x+1} = 36^{x-1}$$

$$6^{x+1} = 6^{2(x-1)} \rightarrow \frac{x+1}{-x+2} = \frac{2x-2}{-x+2}$$

$$3 = x$$

$$20. \frac{9^{x^2-2x} = 27^{x^2+1}}{3^{2(x^2-2x)} = 3^{3(x^2+1)}}$$

$$\frac{2x^2-4x = 3x^2+3}{-2x^2+4x \quad -2x^2+4x}$$

$$0 = x^2 + 4x + 3$$

$$(x+3)(x+1) = 0$$

$$x+3=0 \quad x+1=0$$

$$x = -3 \quad x = -1$$

$$21. \log_4(x+2) + \log_4(x-4) = 2$$

$$\log_4[(x+2)(x-4)] = 2$$

$$x^2 - 2x - 8 = 4^2$$

$$x^2 - 2x - 8 = 16$$

$$x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$x-6=0$$

$$x+4=0$$

$$x = 6$$

$$x = -4$$

$$22. \log_7(3x+5) - \log_7(x-5) = \log_7 8$$

$$\log_7\left(\frac{3x+5}{x-5}\right) = \log_7 8$$

$$3x+5 = 8(x-5)$$

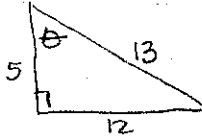
$$\frac{3x+5}{-3x+40} = \frac{8x-40}{-3x+40}$$

$$\frac{45}{5} = \frac{5x}{5}$$

$$\rightarrow 9 = x$$

Asmt 52 - Continued

23. $\tan \theta = \frac{12}{5}$



$$\sin \theta = \frac{12}{13}, \quad \cos \theta = \frac{5}{13}$$

24. $\sin \theta = \frac{\sqrt{2}}{2}$

$$\theta = \frac{\pi}{4}, \frac{3\pi}{4}$$

25. $\tan \theta = -\frac{\sqrt{3}}{3}$

$$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$$

26. $\sin \theta = 0$

$$\theta = 0^\circ, 180^\circ$$

27. $\cos \theta = \frac{1}{2}$

$$\theta = 60^\circ, 300^\circ$$

28. $f(x) = 15.4x^2 + 3.7x - 5.25$
(find zeros)

$$x = -.716, .476$$

29. $p = \$750$ $y = 2(750) = \$1500$ $t = 5$ $r = ?$

$$\frac{1500}{750} = \frac{750e^{5r}}{750} \rightarrow \ln 2 = e^{5r} \rightarrow \frac{\ln 2}{5} = \frac{5r}{5} \rightarrow r = \frac{\ln 2}{5} = .1386$$

$$= 13.86\%$$

30. $y = 2x$ $p = x$ $r = 3.5\% = .035$ $t = ?$

$$\ln 2 = \ln e^{.035t} \rightarrow \ln 2 = .035t \rightarrow t = \frac{\ln 2}{.035} = 19.80 \text{ years}$$

31. $p = 4100$ $r = 55\% = .55$

(2 pts) a) $t = 3$

$$y = 4100 e^{(.55 \times 3)} = 21,349 \text{ rabbits}$$

b) $y = 50000$

$$\frac{50000}{4100} = \frac{4100 e^{.55t}}{4100}$$

$$\ln\left(\frac{5000}{41}\right) = \ln e^{.55t}$$

$$\frac{\ln\left(\frac{5000}{41}\right)}{.55} = \frac{.55t}{.55}$$

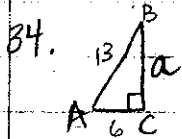
$$t = \frac{\ln\left(\frac{5000}{41}\right)}{.55} = 4.55 \text{ years}$$

$$32. \cos \theta = .75 \rightarrow \theta = \cos^{-1}(.75) = \boxed{.7227}$$

Page 778

$$22. \cos 23 = \frac{32}{x} \rightarrow x = \frac{32}{\cos 23} = \boxed{34.8^\circ}$$

(2pts)



34.

$$a^2 + 6^2 = 13^2$$

$$a = \sqrt{13^2 - 6^2} = 11.5$$

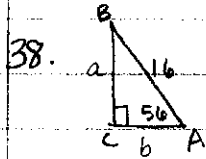
$$\sin \angle B = \frac{6}{13} \rightarrow \angle B = \sin^{-1}\left(\frac{6}{13}\right) = 27^\circ$$

$$\angle A = 63^\circ \quad a = 11.5$$

$$\angle B = 27^\circ \quad b = 6$$

$$\angle C = 90^\circ \quad c = 13$$

(2pts)



38.

$$\sin 56 = \frac{a}{16}$$

$$a = 16(\sin 56) = 13.3$$

$$\cos 56 = \frac{b}{16}$$

$$b = 16(\cos 56) = 8.9$$

$$\angle A = 56^\circ \quad a = 13.3$$

$$\angle B = 34^\circ \quad b = 8.9$$

$$\angle C = 90^\circ \quad c = 16$$

Page 784

$$24. \frac{-315^\circ \cdot \pi}{180^\circ} = -\frac{63\pi}{36} = \boxed{\frac{-7\pi}{4}}$$

$$26. \frac{150^\circ \cdot \pi}{180^\circ} = \frac{15\pi}{18} = \boxed{\frac{5\pi}{6}}$$

$$30. \frac{-\pi}{2} \cdot \frac{90}{\pi} = \boxed{-90^\circ}$$

$$32. \frac{3\pi}{4} \cdot \frac{180}{\pi} = \frac{270}{2} = \boxed{135^\circ}$$

$$44. \frac{\pi}{8} \quad \text{positive: } \frac{\pi}{8} + \frac{16\pi}{8} = \boxed{\frac{17\pi}{8}}$$

$$\text{negative: } \frac{\pi}{8} - \frac{16\pi}{8} = \boxed{\frac{-15\pi}{8}}$$