



Advanced Math

pg 213

1) g 2) c 3) b 4) h 5) f 6) a 7) e 8) d

10a) Up 1 12a) Right 2 b) Right 2
 b) Down 1 Upside Down Fat
 c) Up 3 Fat Up 1
 d) Down 3 Up 1

14) $F(x) = \frac{1}{2}x^2 - 4$

vertex (0, -4)

$0 = \frac{1}{2}x^2 - 4$

$4 = \frac{1}{2}x^2$

$8 = x^2$

$\pm\sqrt{8} = x$

$\{ \pm 2\sqrt{2} \}$

y-int (0, -4)

16) $h(x) = 25 - x^2$

vertex (0, 25)

$0 = 25 - x^2$

$x^2 = 25$

$x = \pm 5$

$\{ \pm 5 \}$

y-int (0, 25)

18) $F(x) = (x-6)^2 + 3$

vertex (6, 3)

$0 = (x-6)^2 + 3$

$-3 = (x-6)^2$

$\pm\sqrt{-3} = x-6$

$\{ 6 \pm i\sqrt{3} \}$

y-int (0, 39)

20) $g(x) = x^2 + 2x + 1$

$g(x) = (x^2 + 2x) + 1$

$g(x) = (x^2 + 2x + 1) + 1 - 1$

* $g(x) = (x+1)^2$

$0 = (x+1)^2$

$x = -1$

vertex (-1, 0)

$\{ -1 \}$ y-int (0, 1)

22) $F(x) = x^2 + 3x + \frac{1}{4}$

$F(x) = (x^2 + 3x) + \frac{1}{4}$

$F(x) = (x^2 + 3x + \frac{9}{4}) + \frac{1}{4} - \frac{9}{4}$

* $F(x) = (x + \frac{3}{2})^2 - 2$

$0 = (x + \frac{3}{2})^2 - 2$

$2 = (x + \frac{3}{2})^2$

$\pm\sqrt{2} = x + \frac{3}{2}$

vertex $(-\frac{3}{2}, -2)$

$\{ \frac{-3}{2} \pm \sqrt{2} \}$ y-int $(0, \frac{1}{4})$

24) $F(x) = -x^2 - 4x + 1$

$F(x) = (-x^2 - 4x) + 1$

$F(x) = -(x^2 + 4x + 4) + 4 + 1 - 4$

* $F(x) = -(x+2)^2 + 5$

$0 = -(x+2)^2 + 5$

$-5 = -(x+2)^2$

$5 = (x+2)^2$

$\pm\sqrt{5} = x+2$

vertex (-2, 5)

$\{ -2 \pm \sqrt{5} \}$ y-int (0, 1)

26) $F(x) = 2x^2 - x + 1$

$F(x) = (2x^2 - x) + 1$

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

$F(x) = 2(x^2 - \frac{1}{2}x + \frac{1}{16}) + 1 - \frac{1}{8}$

* $F(x) = 2(x - \frac{1}{4})^2 + \frac{7}{8}$

$0 = 2(x - \frac{1}{4})^2 + \frac{7}{8}$

$-\frac{7}{8} = 2(x - \frac{1}{4})^2$

$-\frac{7}{16} = (x - \frac{1}{4})^2$

$\pm\sqrt{-\frac{7}{16}} = (x - \frac{1}{4}) \Rightarrow \frac{1}{4} \pm \frac{i\sqrt{7}}{4}$

vertex $(\frac{1}{4}, \frac{7}{8})$

$\{ \frac{1 \pm i\sqrt{7}}{4} \}$

y-int (0, 1)

29) vertex (-4, -5)

$\{ -6.236, -1.764 \}$

y-int (0, 11)

30) vertex (-2, -3)

$\{ -4.449, .449 \}$

y-int (0, -1)



32) $F(x) = a(x-h)^2 + k$
 $F(x) = a(x-0)^2 + 1$
 $F(x) = ax^2 + 1$
 $0 = a(1)^2 + 1$
 $-1 = a$

$F(x) = -x^2 + 1$

34) $g(x) = a(x-h)^2 + k$
 $g(x) = a(x+2)^2 - 1$
 $3 = a(0+2)^2 - 1$
 $4 = 4a$
 $1 = a$

$g(x) = (x+2)^2 - 1$

36) $h(x) = a(x-h)^2 + k$
 $h(x) = a(x-2)^2 + 0$
 $2 = a(3-2)^2$
 $2 = a$

$h(x) = 2(x-2)^2$

38) $F(x) = a(x-h)^2 + k$
 $F(x) = a(x-4)^2 - 1$
 $3 = a(2-4)^2 - 1$
 $4 = 4a$
 $1 = a$

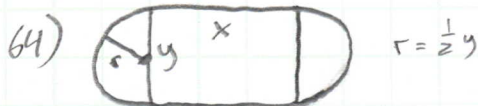
$F(x) = (x-4)^2 - 1$

40) $g(x) = a(x-h)^2 + k$
 $g(x) = a(x-2)^2 + 3$
 $2 = a(0-2)^2 + 3$
 $-1 = a(4)$
 $-\frac{1}{4} = a$

$g(x) = -\frac{1}{4}(x-2)^2 + 3$

42) $h(x) = a(x-h)^2 + k$
 $h(x) = a(x+2)^2 - 2$
 $0 = a(-1+2)^2 - 2$
 $2 = a$

$h(x) = 2(x+2)^2 - 2$



b) $C = 2\pi r$
 $C = 2\pi(\frac{1}{2}y)$
 $C = \pi y$

c) $2x + \pi y = 200$
 $\pi y = 200 - 2x$
 $y = \frac{200 - 2x}{\pi}$

d) $A = l \cdot w = x \cdot y$
 $A(x) = x \left(\frac{200 - 2x}{\pi} \right)$

Max dimensions $50 \text{ m} \times \frac{100}{\pi} \text{ m}$
 $50 \text{ m} \times 31.831 \text{ m}$

65) 4500 units

66) 250,000 units

67) 20 Fixtures

68) ≈ 1222 units

69) 350,000 units

70) 2000 dollars Note 20 x 100 dollars

71) a) 4 Feet
 b) 16 Feet

c) 25.86 Feet

72) 16 Feet

73) b) 166 board Feet
 c) 26.59 in

74) b) 69.6 mph

75) b) 1968. Yes, usage began to decline

c) annual: $4024 \left(\frac{11653000}{48500000} \right) = 9668.39$
 daily: $\frac{9668.39}{365} = 26.49$