p629 10.4 1-37 all, 43

(1) $\sqrt{-36} = \sqrt{36}\sqrt{-1} = 6i$

(2) $\sqrt{-49} = \sqrt{49}\sqrt{-1} = \boxed{7i}$

(3) $\sqrt{-13} = \sqrt{13}\sqrt{-1} = \boxed{\sqrt{13}\,i \text{ or } i\sqrt{13}}$

(4) $\sqrt{-19} = \sqrt{19}\sqrt{-1} = \boxed{\sqrt{19}\,i \text{ or } i\sqrt{19}}$

(5) $\sqrt{-50} = \sqrt{25\cdot 2}\sqrt{-1} = \boxed{5\sqrt{2}\,i}$

(6) $\sqrt{-12} = \sqrt{4\cdot 3}\sqrt{-1} = \boxed{2\sqrt{3}\,i}$

(7) $\sqrt{-20} = \sqrt{4\cdot 5}\sqrt{-1} = \boxed{2\sqrt{5}\,i}$

(8) $\sqrt{-300} = \sqrt{100\cdot 3}\sqrt{-1} = \boxed{10\sqrt{3}\,i}$

(9) $-\sqrt{-28} = -\sqrt{4\cdot 7}\sqrt{-1} = \boxed{-2\sqrt{7}\,i}$

(10) $-\sqrt{-150} = -\sqrt{25\cdot 6}\sqrt{-1} = \boxed{-5\sqrt{6}\,i}$

(11) $7+\sqrt{-16} = 7+\sqrt{16}\sqrt{-1} = \boxed{7+4i}$

(12) $9+\sqrt{-4} = 9+\sqrt{4}\sqrt{-1} = \boxed{9+2i}$

(13) $10+\sqrt{-3} = 10+\sqrt{3}\sqrt{-1} = \boxed{10+\sqrt{3}\,i}$

(14) $5+\sqrt{-5} = 5+\sqrt{5}\sqrt{-1} = \boxed{5+\sqrt{5}\,i}$

(15) $6-\sqrt{-98} = 6-\sqrt{49\cdot 2}\sqrt{-1} = \boxed{6-7\sqrt{2}\,i}$

(16) $6-\sqrt{-18} = 6-\sqrt{9\cdot 2}\sqrt{-1} = \boxed{6-3\sqrt{2}\,i}$

(17) $(x-3)^2 = -9$

$\sqrt{(x-3)^2} = \pm\sqrt{-9}$

$x-3 = \pm\sqrt{9}\sqrt{-1}$

$x = \boxed{3\pm 3i}$

(18) $(x-5)^2 = -36$

$\sqrt{(x-5)^2} = \pm\sqrt{-36}$

$x-5 = \pm\sqrt{36}\sqrt{-1}$

$x = \boxed{5\pm 6i}$

(19) $(x+7)^2 = -64$

$\sqrt{(x+7)^2} = \pm\sqrt{-64}$

$x+7 = \pm\sqrt{64}\sqrt{-1}$

$x = \boxed{-7\pm 8i}$

(20) $(x+12)^2 = -100$

$\sqrt{(x+12)^2} = \pm\sqrt{-100}$

$x+12 = \pm\sqrt{100}\sqrt{-1}$

$x = \boxed{-12\pm 10i}$

(21) $(x-2)^2 = -7$

$\sqrt{(x-2)^2} = \pm\sqrt{-7}$

$x-2 = \pm\sqrt{7}\sqrt{-1}$

$x = \boxed{2\pm\sqrt{7}\,i}$

(22) $(x-1)^2 = -13$

$\sqrt{(x-1)^2} = \pm\sqrt{-13}$

$x-1 = \pm\sqrt{13}\sqrt{-1}$

$x = \boxed{1\pm\sqrt{13}\,i}$

(23) $(y+3)^2 = -18$

$\sqrt{(y+3)^2} = \pm\sqrt{-18}$

$y+3 = \pm\sqrt{9\cdot 2}\sqrt{-1}$

$y = \boxed{-3\pm 3\sqrt{2}\,i}$

(24) $(y+4)^2 = -48$

$\sqrt{(y+4)^2} = \pm\sqrt{-48}$

$y+4 = \pm\sqrt{16\cdot 3}\sqrt{-1}$

$y = \boxed{-4\pm 4\sqrt{3}\,i}$

p629 10.4

(25) $x^2+4x+5=0$

$a=1$, $b=4$, $c=5$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$=\frac{-4\pm\sqrt{4^2-4(1)(5)}}{2(1)}$

$=\frac{-4\pm\sqrt{16-20}}{2}$

$=\frac{-4\pm\sqrt{-4}}{2}$

$=\frac{-4\pm 2i}{2}$

$\boxed{\{-2\pm i\}}$

(26) $x^2+2x+2=0$ $a=1$, $b=2$, $c=2$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$=\frac{-2\pm\sqrt{2^2-4(1)(2)}}{2(1)}$

$=\frac{-2\pm\sqrt{4-8}}{2}$

$=\frac{-2\pm\sqrt{-4}}{2}$

$=\frac{-2\pm 2i}{2}$

$\boxed{\{-1\pm i\}}$

(27) $x^2-6x+13=0$

$a=1$, $b=-6$, $c=13$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$=\frac{-(-6)\pm\sqrt{(-6)^2-4(1)(13)}}{2(1)}$

$=\frac{6\pm\sqrt{36-52}}{2}$

$=\frac{6\pm\sqrt{-16}}{2}$

$=\frac{6\pm 4i}{2}$

$\boxed{\{3\pm 2i\}}$

(28) $x^2-6x+10=0$ $a=1$, $b=-6$, $c=10$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$=\frac{-(-6)\pm\sqrt{(-6)^2-4(1)(10)}}{2(1)}$

$=\frac{6\pm\sqrt{36-40}}{2}$

$=\frac{6\pm\sqrt{-4}}{2}$

$=\frac{6\pm 2i}{2}$

$\{3\pm i\}$

p629 10.4

(29) $x^2 - 12x + 40 = 0$

$a=1$, $b=-12$, $c=40$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(40)}}{2(1)}$

$= \frac{12 \pm \sqrt{144-160}}{2}$

$= \frac{12 \pm \sqrt{-16}}{2}$

$= \frac{12 \pm 4i}{2}$

$\{6 \pm 2i\}$

(30) $x^2 - 4x + 29 = 0$

$a=1$, $b=-4$, $c=29$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(29}}{2(1)}$

$= \frac{4 \pm \sqrt{16-116}}{2}$

$= \frac{4 \pm \sqrt{-100}}{2}$

$= \frac{4 \pm 10i}{2}$

$\{2 \pm 5i\}$

(31) $x^2 = 10x - 27$

$x^2 - 10x + 27 = 0$

$a=1$, $b=-10$, $c=27$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(27)}}{2(1)}$

$= \frac{10 \pm \sqrt{100-108}}{2}$

$= \frac{10 \pm \sqrt{4 \cdot 2} \sqrt{-1}}{2}$

$= \frac{10 \pm 2\sqrt{2}i}{2}$

$\{5 \pm \sqrt{2}i\}$

(32) $x^2 - 4x - 7$

$x^2 - 4x + 7 = 0$

$a=1$, $b=-4$, $c=7$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(7)}}{2(1)}$

$= \frac{4 \pm \sqrt{16-28}}{2}$

$= \frac{4 \pm \sqrt{4 \cdot 3} \sqrt{-1}}{2}$

$= \frac{4 \pm 2\sqrt{3}i}{2}$

$\{2 \pm \sqrt{3}i\}$

p629

10.4

(33) $5x^2 - 2x - 3$

$5x^2 - 2x + 3 = 0$

$a=5$, $b=-2$, $c=3$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-2) \pm \sqrt{(-2)^2-4(5)(3)}}{2(5)}$

$= \frac{2 \pm \sqrt{4-60}}{10}$

$= \frac{2 \pm \sqrt{4 \cdot 14^1}\sqrt{-1}}{10}$

$= \frac{2 \pm 2\sqrt{14}i}{10}$

$= \boxed{\frac{1 \pm \sqrt{14}i}{5}}$

(34) $6x^2 = -2x - 1$

$6x^2 + 2x + 1 = 0$

$a=6$, $b=2$, $c=1$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-2 \pm \sqrt{2^2-4(6)(1)}}{2(6)}$

$= \frac{-2 \pm \sqrt{4-24}}{12}$

$= \frac{-2 \pm \sqrt{4 \cdot 5}\sqrt{-1}}{12}$

$= \frac{-2 \pm 2\sqrt{5}i}{12}$

$= \boxed{\left\{\frac{-1 \pm \sqrt{5}i}{6}\right\}}$

(35) $2y^2 = 4y - 5$

$2y^2 - 4y + 5 = 0$

$a=2$, $b=-4$, $c=5$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-4) \pm \sqrt{(-4)^2-4(2)(5)}}{2(2)}$

$= \frac{4 \pm \sqrt{16-40}}{4}$

$= \frac{4 \pm \sqrt{4 \cdot 6^1}\sqrt{-1}}{4}$

$= \frac{4 \pm 2\sqrt{6}i}{4}$

$= \boxed{\left\{\frac{2 \pm \sqrt{6}i}{2}\right\}}$

(36) $5y^2 = 6y - 7$

$5y^2 - 6y + 7 = 0$

$a=5$, $b=-6$, $c=7$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-6) \pm \sqrt{(-6)^2-4(5)(7)}}{2(5)}$

$= \frac{6 \pm \sqrt{36-140}}{10}$

$= \frac{6 \pm \sqrt{4 \cdot 26}\sqrt{-1}}{10}$

$= \frac{3 \pm 2\sqrt{26}i}{10}$ $\Big)$ $\boxed{\left\{\frac{3 \pm \sqrt{26}i}{5}\right\}}$

p629 10.4

(37) $12x^2 + 35 = 8x^2 + 15$

$-8x^2 \quad -15 \quad -8x^2 \quad -15$

$\frac{4x^2}{4} + \frac{20}{4} = \frac{0}{4}$

$x^2 + 5 = 0$

$x^2 = -5$

$x = \pm\sqrt{-5}$

$x = \pm\sqrt{5}\sqrt{-1}$

$\boxed{x = \pm\sqrt{5}i}$

(43) $R = -2x^2 + 36x$

$200 = -2x^2 + 36x$

$-200 \quad -200$

$0 = -2x^2 + 36x - 200$

$\frac{0}{-2} = \frac{x^2}{-2} - \frac{18x}{-2} + \frac{100}{-2}$

$0 = x^2 - 18x + 100$

$a = 1$

$b = -18$

$c = 100$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{-(-18) \pm \sqrt{18^2 - 4(1)(100)}}{2(1)}$

$= \frac{18 \pm \sqrt{-76}}{2}$

$= \frac{18 \pm \sqrt{4 \cdot 19}\sqrt{-1}}{2}$

$= \frac{18 \pm 2\sqrt{19}i}{2}$

$= 9 \pm \sqrt{19}i$

Not a Real Number
Hence there is no price that will generate $200,000.