P.5 p.46 1-6, 7-12, 25-32

#1 $x^2 - x - 20 = 0$

$(x-5)(x+4) = 0$

$x = 5$ $x = -4$

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

$(2x-1)(x+3) = 0$

$x = \frac{1}{2}$ $x = -3$

#3 $4x^2 - 8x + 3 = 0$

$(2x-3)(2x-1) = 0$

$x = \frac{3}{2}$ $x = \frac{1}{2}$

#4 $x^2 - 8x = -15$

$x^2 - 8x + 15 = 0$

$(x-5)(x-3) = 0$

$x = 5$ $x = 3$

#5 $x(3x-7) = 6$

$3x^2 - 7x - 6 = 0$

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

$x = -\frac{2}{3}$ $x = 3$

#6 $x(3x+11) = 20$

$3x^2 + 11x - 20 = 0$

$(3x-4)(x+5) = 0$

$x = \frac{4}{3}$ $x = -5$

#7 $\frac{4x^2}{4} = \frac{25}{4}$

$\sqrt{x^2} = \sqrt{\frac{25}{4}}$

$x = \pm\frac{5}{2}$

#8 $\frac{2(x-5)^2}{2} = \frac{17}{2}$

Divide first

$\sqrt{(x-5)^2} = \sqrt{\frac{17}{2}}$

$x - 5 = \pm\sqrt{\frac{17}{2}}$

$x = 5 \pm \sqrt{\frac{17}{2}}$

Question on test using similar reasoning! One of the most missed questions!

#9 $\frac{3(x+4)^2}{3} = \frac{8}{3}$

Divide first

$\sqrt{(x+4)^2} = \sqrt{\frac{8}{3}}$

$x + 4 = \pm\sqrt{\frac{8}{3}}$

$x = -4 \pm \sqrt{\frac{8}{3}}$

#10 $\frac{4(u+1)^2}{4} = \frac{18}{4}$

$\sqrt{(u+1)^2} = \sqrt{\frac{9}{2}}$

$u + 1 = \pm\sqrt{\frac{9}{2}}$

$-1 \quad -1$

$u = -1 \pm \sqrt{\frac{9}{2}}$

#11 $2y^2 - 8 = 6 - 2y^2$

$+2y^2 \quad +8 \quad +8 \quad +2y^2$

$\frac{4y^2}{4} = \frac{14}{4}$

$\sqrt{y^2} = \sqrt{\frac{7}{2}}$

$y = \pm\sqrt{\frac{7}{2}}$

#12 $\sqrt{(2x+3)^2} = \sqrt{169}$

$2x + 3 = \pm 13$

$-3 \quad -3$

$2x = 10$ AND $2x = -16$

$x = 5$ $x = -8$

Don't forget the + and − when square rooting...

#25 $(3,0)$ $(0,-2)$

#26 $(1,0)(3,0)(0,3)$

#27 $(-2,0)(0,0)(2,0)$

#28 No x-int's
No y-int's

#29 $x^2+x-1=0$

calculator!

$(-1.618,0)$ $(.618,0)$

#30 $4x^2+20x+23=0$

$(-3.207,0)$ $(-1.793,0)$

#31 $x^3+x^2+2x-3=0$

$(.844,0)$

#32 $x^3-4x+2=0$

$(-2.214,0)$ $(.539,0)$
$(1.675,0)$

P.5 p.46 20-24e 39-45odd

#20 $2x^2-3x+1=0$

$x=\frac{3\pm\sqrt{9-4(2)(1)}}{4}$

$x=\frac{3\pm\sqrt{1}}{4}=\frac{3+1}{4}=\boxed{1=x}$

$\frac{3-1}{4}=\boxed{\frac{1}{2}=x}$

#22 $x^2-5=\sqrt{3}x$

$x^2-\sqrt{3}x-5=0$

$x=\frac{\sqrt{3}\pm\sqrt{3-4(1)(-5)}}{2}$

$\boxed{x=\frac{\sqrt{x}\pm\sqrt{23}}{2}}$

#24 $x^2-2x+6=2x^2-6x-26$

$-x^2+2x-6 \quad -x^2+2x-6$

$0=x^2-4x-32$

$x=\frac{4\pm\sqrt{16-4(1)(-32)}}{2}=\frac{4\pm\sqrt{16+128}}{2}=\frac{4\pm\sqrt{144}}{2}$

$=\frac{4+12}{2} \quad \frac{4-12}{2}$

$\boxed{x=8,-4}$

#39 $|t-8|=2$

$t-8=2 \quad t-8=-2$

$+8\ +8 \quad +8\ +8$

$\boxed{t=10} \quad \boxed{t=6}$

#41 $|2x+5|=7$

$2x+5=7 \quad 2x+5=-7$

$-5\ -5 \quad -5\ -5$

$\frac{2x}{2}=\frac{2}{2} \quad \frac{2x}{2}=\frac{-12}{2}$

$\boxed{x=1} \quad \boxed{x=-6}$

#43 $|2x-3|=x^2$

$2x-3=x^2 \quad 2x-3=-x^2$

$-2x+3 \quad -2x+3$

$0=x^2-2x+3 \quad x^2+2x-3=0$

$0=(x\ \ )(x\ \ ) \quad (x+3)(x-1)=0$

$\boxed{x=-3,1}$

#45 a) $y_1=3\sqrt{x+4}$

$y_2=x^2-1$

b) $y=3\sqrt{x+4}-x^2+1$

c) x values are the same in either equation

P.6 p. 52 1–27 (odd)

#1 $(2-3i)+(6+5i)$

$= \boxed{8+2i}$

#3 $(7-3i)+(6-i)$

$= \boxed{13-4i}$

#4 $(2+i)-(9i-3)$

$2+i-9i+3$

$= \boxed{5-8i}$

That is Not odd oops

#5 $(2-i)+(3-\sqrt{-3})$

$3-\sqrt{3}i$

$= 5-i-\sqrt{3}i$ or $5-(1+\sqrt{3})i$

#7 $(i^2+3)-(7+i^3)$

$-i^3+i^2-4 = -(-i)+1-4$

$= -(-i)-5$

$= \boxed{i-5}$

#9 $(2+3i)(2-i)$

$= 4-2i+6i-3i^2$

$= 4+4i+3$

$= \boxed{7+4i}$

#11 $(1-4i)(3-2i)$

$= 3-2i-12i+8i^2$

$= 3-14i-8$

$= \boxed{-5-14i}$

#13 $(7i-3)(2+6i)$

$= 14i+42i^2-6-18i$

$= \boxed{-4i-48}$ $i^2=-1$

#15 $(-3-4i)(1+2i)$

$= -3-6i-4i-8i^2$

$= -3-8i^2-6i-4i$

$= \boxed{5-10i}$ $i^2=-1$

#17 $\sqrt{-16} = \boxed{4i}$

#19 $\sqrt{-3} = \boxed{i\sqrt{3}}$

#21 $2+3i = x+yi$

$a+bi = a+bi$

$\boxed{x=2 \quad y=3}$

#23 $(5-3i)-7 = x-(3+yi)$

$-2-3i = (x-3)-yi$

$-2 = x-3$ (+3 +3) $\quad -2i = -yi$

$\boxed{1=x} \qquad \boxed{y=2}$

#25 $(3+2i)^2 = (3+2i)(3+2i)$

$= 9+6i+6i+4i^2$

$= 9+12i+4(-1)$

$= \boxed{5+12i}$

#27 $\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)^4 = \left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)$

$$\left[\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}i\right)=\right]^2$$

$$\left[\frac{2}{4}+\frac{2}{4}i+\frac{2}{4}i+\frac{2}{4}i^2=\right]^2$$

$$\left[\frac{1}{2}+\frac{1}{2}i+\frac{1}{2}i+\frac{1}{2}(-1)=\right]^2$$

$$[i]^2$$

$$= i^2 = \boxed{-1}$$

P.6 p. 52

29 – 43 (odd)

#29 $(2-3i)(2+3i)$

$= 4-9i^2$

$= 4-9(-1)$

$= 4+9 = \boxed{13}$

#31 $(-3+4i)(-3-4i)$

$= 9-16i^2 = 9-16(-1)$

$= 9+16 = \boxed{25}$

#33 $\frac{1}{2+i}\cdot\frac{2-i}{2-i} = \frac{2-i}{4-i^2} = \boxed{\frac{2-i}{5}}$

$4+1$

#35 $\frac{2+i}{2-i}\cdot\frac{2+i}{2+i} = \frac{4+4i+i^2}{4-i^2} = \boxed{\frac{3+4i}{5}}$

$4+2i+2i+i^2$; $i^2=-1$; $-i^2=-1$

#37 $\frac{(2+i)^2(-i)}{1+i} = \frac{(4+4i+i^2)(-i)}{1+i} = (3+4i)(-i) = -3i-4i^2 = \frac{-3i+4}{1+i}$

$\frac{-3i+4}{1+i}\cdot\frac{1-i}{1-i} = \frac{-3i+3i^2+4-4i}{1-i^2} = \boxed{\frac{-7i+1}{2}}$

#39 ~~[illegible]~~ $\frac{(1-i)(2-i)}{1-2i} = \frac{2-i-2i+i^2}{1-2i} = \frac{1-3i}{1-2i}\cdot\frac{1+2i}{1+2i} = \frac{1+2i-3i-6i^2}{1-4i^2}$

$= \boxed{\frac{7-i}{5}}$

(#41) $x^2 + 2x + 5 = 0$

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

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

$$= \frac{-2 \pm 4i}{2} = \boxed{-1 \pm 2i}$$

(#43) $4x^2 - 6x + 5 = x + 1$

$\quad -x - 1 \quad -x - 1$

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

$$x = \frac{7 \pm \sqrt{49 - 4(4)(4)}}{8}$$

$$= \frac{7 \pm \sqrt{-15}}{8} = \boxed{\frac{7 \pm i\sqrt{15}}{8}}$$

P.7 p.58 1-8

#1 $|x+4| \geq 5$

$x+4 \geq 5$ $\quad$ $x+4 \leq -5$

$-4 \quad -4$ $\quad$ $-4 \quad -4$

$x \geq 1$ $\quad$ $x \leq -9$

$(-\infty, -9] \cup [1, \infty)$

#2 $|2x-1| > 3.6$

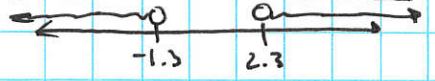
$2x-1 > 3.6$ $\quad$ $2x-1 < -3.6$

$+1 \quad +1$ $\quad$ $+1 \quad +1$

$\frac{2x}{2} > \frac{4.6}{2}$ $\quad$ $\frac{2x}{2} < \frac{-2.6}{2}$

$x > 2.3$ $\quad$ $x < -1.3$

$(-\infty, -1.3) \cup (2.3, \infty)$



#3 $|x-3| < 2$

$x-3 < 2$ $\quad$ $x-3 > -2$

$x < 5$ $\quad$ $x > 1$

$(1, 5)$

#4 $|x+3| \leq 5$

$x+3 \leq 5$ $\quad$ $x+3 \geq -5$

$x \leq 2$ $\quad$ $x \geq -8$

$[-8, 2]$

#5 $|4-3x| - 2 < 4$

$+2 \quad +2$

$|4-3x| < 6$

$4-3x < 6$ $\quad$ $4-3x > -6$

$-4 \quad -4$ $\quad$ $-4 \quad -4$

$\frac{-3x}{-3} < \frac{2}{-3}$ $\quad$ $\frac{-3x}{-3} > \frac{-10}{-3}$

$x > -\frac{2}{3}$ $\quad$ $x < \frac{10}{3}$

$\left(-\frac{2}{3}, \frac{10}{3}\right)$

#6 $|3-2x| + 2 > 5$

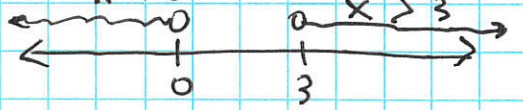
$|3-2x| > 3$

$3-2x > 3$ $\quad$ $3-2x < -3$

$-3 \quad -3$ $\quad$ $-3 \quad -3$

$\frac{-2x}{-2} > \frac{0}{-2}$ $\quad$ $\frac{-2x}{-2} < \frac{-6}{-2}$

$x < 0$ $\quad$ $x > 3$



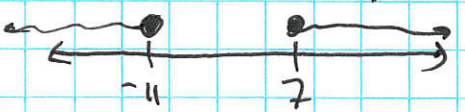
$(-\infty, 0) \cup (3, \infty)$

#7 $\left|\frac{x+2}{3}\right| \geq 3$

$3\left(\frac{x+2}{3} \geq 3\right)$ $\quad$ $\left(\frac{x+2}{3} \leq -3\right)3$

$x+2 \geq 9$ $\quad$ $x+2 \leq -9$

$x \geq 7$ $\quad$ $x \leq -11$



$(-\infty, -11] \cup [7, \infty)$

#8 $\left|\frac{x-5}{4}\right| \leq 6$

$4\left(\frac{x-5}{4} \leq 6\right) \quad \left(\frac{x-5}{4} \geq -6\right)4$

$x-5 \leq 24 \qquad x-5 \geq -24$

$x \leq 29 \qquad x \geq -19$

$[-19, 29]$

D.7 p. 58 10, 11, 14, 16, 33

#10 $6x^2 - 13x + 6 \geq 0$

$(3x-2)(2x-3) = 0$

$x = \frac{2}{3} \qquad x = \frac{3}{2}$

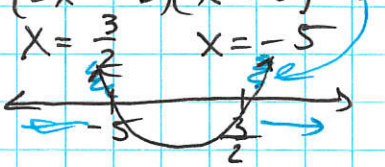
$\left(-\infty, \frac{2}{3}\right] \cup \left[\frac{3}{2}, \infty\right)$

#11 $2x^2 + 7x > 15$

$2x^2 + 7x - 15 > 0$

$(2x-3)(x+5) = 0$

$x = \frac{3}{2} \qquad x = -5$



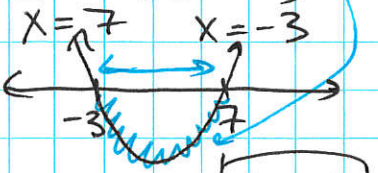
#14 $21 + 4x - x^2 > 0$

$\frac{-x^2 + 4x + 21}{-1} > \frac{0}{-1}$

$x^2 - 4x - 21 < 0$

$(x-7)(x+3) = 0$

$x = 7 \qquad x = -3$



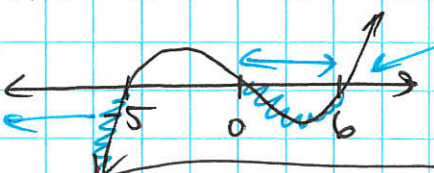
$(-3, 7)$

#16 $x^3 - x^2 - 30x \leq 0$

$x(x^2 - x - 30) \leq 0$

$x(x-6)(x+5) = 0$

$x = 0 \qquad x = 6 \qquad x = -5$



$(-\infty, -5] \cup [0, 6]$

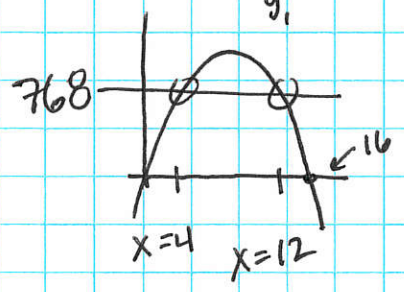
#33 $S = -16t^2 + V_0 t + S_0$

Ground level: $S_0 = 0$

Initial Velocity: $V_0 = 256$ ft/sec

a) $-16t^2 + 256t = 768$

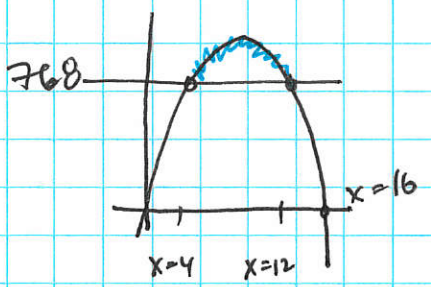
$y_1 \qquad\qquad y_2$



At $t=4$, $t=12$ seconds the projectile will be at 768 feet

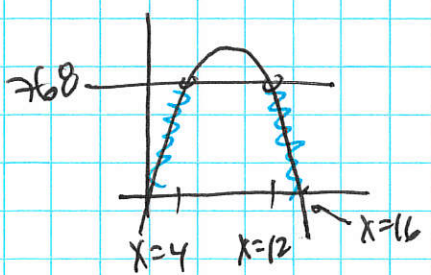
b) $-16t^2 + 256t \geq 768$

At least!



$[4, 12]$ seconds

c) $-16t^2 + 256t \leq 768$



$(0, 4] \cup [12, 16)$ seconds