The rest of 11.4

ex 40 $z^2 = (\sqrt{5z-4})^2$

$z^2 = 5z - 4$

$-5z \quad -5z \quad +4$

$+4$

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

$(z-4)(z-1) = 0$

$z = 4$ $z = 1$

Apr 18-6:29 PM

ex 48 $r = \left(\sqrt{\frac{20-19r}{6}}\right)^2$

$6 \cdot r^2 = \frac{20-19r}{6} \cdot 6$

$6r^2 = 20 - 19r$

$-20 \quad -20 \quad +19r$

$+19r$

$6r^2 + 19r - 20 = 0$

$r = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$

$= \frac{-19 \pm \sqrt{19^2 - 4(6)(-20)}}{2(6)}$

$= \frac{-19 \pm \sqrt{841}}{12}$

$= \frac{-19 \pm 29}{12}$

$\frac{10}{12}$ or $\frac{-48}{12}$

$\frac{5}{6}$ $-4$

check

$r = \sqrt{\frac{20-19r}{6}}$

$\frac{5}{6} \stackrel{?}{=} \sqrt{\frac{20-19(\frac{5}{6})}{6}}$

$\frac{5}{6} = \sqrt{\frac{\frac{20}{1} - \frac{95}{6}}{6}}$

$\frac{5}{6} = \sqrt{\frac{\frac{120}{6} - \frac{95}{6}}{6}}$

$\frac{5}{6} = \sqrt{\frac{\frac{25}{6} \cdot \frac{1}{6}}{6}}$

$\frac{5}{6} = \sqrt{\frac{25}{36}}$

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ex 52 $x^4 - 37x^2 + 36 = 0$

Quadratic $Ax^2 + Bx + C = 0$

$(x^2 - 36)(x^2 - 1) = 0$

$(x-6)(x+6)(x-1)(x+1) = 0$

$\{\pm 1, \pm 6\}$

Let $x^2 = u$

then $x^4 = u^2$

then

$u^2 - 37u + 36 = 0$

$(u - 36)(u - 1) = 0$

$u = 36$ $\quad$ $u = 1$

$\sqrt{x^2} = \sqrt{36}$ $\quad$ $\sqrt{x^2} = \sqrt{1}$

$x = \pm 6$ $\quad$ $x = \pm 1$

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ex 60 $(t+5)^2 + 6 = 7(t+5)$

$-7(t+5) \quad -7(t+5)$

$(t+5)^2 - 7(t+5) + 6 = 0$

Let $u = t + 5$

& $u^2 = (t+5)^2$

$u^2 - 7u + 6 = 0$

$(u-6)(u-1) = 0$

$u = 6 \quad u = 1$

$u = 6$ $\quad$ $u = 1$

$t + 5 = 6$ $\quad$ $t + 5 = 1$

$t = 1$ $\quad$ $t = -4$

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ex62

$x^{2/3} - 2x^{1/3} - 3 = 0$

Let $u = x^{1/3}$ & $u^2 = x^{2/3}$

then $u^2 - 2u - 3 = 0$

$(u-3)(u+1) = 0$

$u = 3$ $\quad u = -1$

$x^{1/3} = 3$ $\quad x^{1/3} = -1$

$(\sqrt[3]{x})^3 = 3^3$ $\quad (\sqrt[3]{x})^3 = (-1)^3$

$x = 27$ $\quad x = -1$

Apr 18-6:57 PM

ex66 $9t^{4/3} - 25t^{2/3} + 16 = 0$

$u = t^{2/3}$, $u^2 = t^{4/3}$

$9u^2 - 25u + 16 = 0$

$u = \frac{25 \pm \sqrt{625 - 576}}{18}$

$= \frac{25 \pm \sqrt{49}}{18} = \frac{25 \pm 7}{18}$

$\frac{32}{18} = \frac{16}{9}$ $\quad \frac{18}{18} = 1$

$u = \frac{16}{9}$ or $u = 1$

$t^{2/3} = \frac{16}{9}$ $\quad t^{2/3} = 1$

$\sqrt[3]{t^2}^3 = \left(\frac{16}{9}\right)^3$ $\quad \sqrt[3]{t^2}^3 = 1^3$

$\sqrt{t^2} = \sqrt{\frac{4096}{729}}$ $\quad \sqrt{t^2} = \sqrt{1}$

$t = \pm\frac{64}{27}$ $\quad t = \pm 1$

Apr 18-7:02 PM

ex68

$(2p+2)^2\left(3-\frac{7}{2p+2}\right)=\left(\frac{6}{(2p+2)^2}\right)(2p+2)^2$

$3(2p+2)^2-7(2p+2)=6$

$3(2p+2)^2-7(2p+2)-6=0$

$u^2$ $u$

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

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

$3u+2=0$ $u=3$

$3u=-2$

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

so, $-\frac{2}{3}=2p+2$ $3=2p+2$

$-2$ $-2$ $-2$

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

$-\frac{8}{3}=2p$ $\frac{1}{2}=p$

$-\frac{4}{3}=p$

Apr 18-7:09 PM

ex78 $8x^6+513x^3+64=0$

$(8x^3+1)(1x^3+64)=0$

~~$(8x^3+64)$~~

$8x^3+1=0$ $x^3+64=0$

$-1$ $-1$ $-64$ $-64$

$8x^3=-1$

$\sqrt[3]{x^3}=\sqrt[3]{-\frac{1}{8}}$ $\sqrt[3]{x^3}=\sqrt[3]{-64}$

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

Apr 18-7:21 PM

11.5 p. 761

ex 8 $\frac{S}{6} = \frac{6e^2}{6}$ solve for e

$\sqrt{\frac{S}{6}} = \sqrt{e^2}$

$\pm\sqrt{\frac{S}{6}} = e$

$e = \pm \frac{\sqrt{S}}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$

$e = \pm \frac{\sqrt{6S}}{6}$

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ex 12 $d^2R = \frac{k}{d^2} d^2$ for d

$\frac{d^2R}{R} = \frac{k}{R}$

$\sqrt{d^2} = \sqrt{\frac{k}{R}}$

$d = \pm \frac{\sqrt{k}}{\sqrt{R}} \cdot \frac{\sqrt{R}}{\sqrt{R}} = \pm \frac{\sqrt{kR}}{R}$

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ex 22 $p = \left(\sqrt{\frac{k\ell}{g}}\right)^2$ for $g$

$g \cdot p^2 = \frac{k\ell}{g} \cdot g$

$gp^2 = k\ell$

$\frac{gp^2}{p^2} = \frac{k\ell}{p^2}$

$g = \frac{k\ell}{p^2}$

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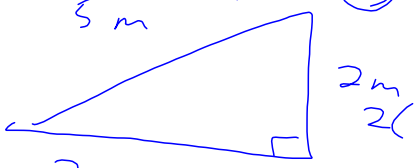
ex 30




$5(1.2) = 6$

$2(1.2) = 2.4$

$2(1.2) + 3 = 5.4$

$(2m+3)(2m+3)$

$(2m)^2 + (2m+3)^2 = (5m)^2$

$4m^2 + 4m^2 + 12m + 9 = 25m^2$

$-25m^2 \quad -25m^2$

$-17m^2 + 12m + 9 = 0$

$m = \frac{-12 \pm \sqrt{144 + 612}}{-34} = \frac{-12 \pm 27.5}{-34}$

$\frac{15.5}{-34}$ neg.

$\frac{-39.5}{-34} \approx 1.2$

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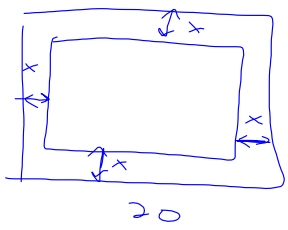
ex 38




rug area = 234

room area = 300

$(15-2x)(20-2x) = 234$

$300 - 30x - 40x + 4x^2 = 234$

$-234 \qquad -234$

$4x^2 - 70x + 66 = 0$

$2x^2 - 35x + 33 = 0$

$(2x-33)(x-1) = 0$

$2x - 33 = 0 \qquad x - 1 = 0$

$2x = 33 \qquad x = 1$

$x = \frac{33}{2} = 16\frac{1}{2}$

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ex 44

$s(t) = 144t - 16t^2$

$\frac{0}{-16} = \frac{144t}{-16} - \frac{16t^2}{-16}$

$0 = -9t + t^2$

$0 = t(-9 + t)$

$t = 0 \qquad -9 + t = 0$

$+9 \qquad +9$

$t = 9 \text{ sec.}$

Apr 18-7:55 PM

ex 5 4

$A = P(1+r)^2$

$\frac{10920.25}{10000} = \frac{10000(1+r)^2}{10000}$

$\sqrt{1.092025} = \sqrt{(1+r)^2}$

$\pm 1.045 = 1 + r$

$-1 \quad -1$

$-1 \pm 1.045 \quad = r$

$-2.045 \quad .045$

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A bit of 11.6

p. 772

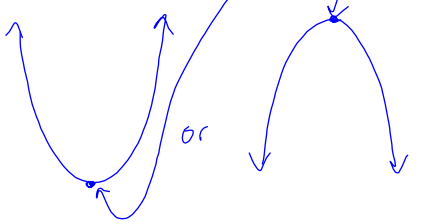
$y = a(x-h)^2 + k$

(h, k) Vertex

ex 6 $f(x) = \frac{1}{2}x^2$

$f(x) = \frac{1}{2}(x-0)^2 + 0$

$V(0,0)$




| x | y |
|---|---|
| 0 | 0 |
| 1 | $\frac{1}{2}$ |
| -1 | $\frac{1}{2}$ |
| 2 | 2 |
| -2 | 2 |

Apr 18-8:04 PM

ex 8 $f(x) = x^2 - 4$

$= (x-0)^2 - 4$ $V(0,-4)$

ex 10 $f(x) = (x+3)^2$ $V(-3,0)$

ex 12 $f(x) = (x+5)^2 - 8$ $V(-5,-8)$

ex 14 $f(x) = -(x-2)^2 + 1$ $V(2,1)$

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