Note Title 2/10/2015

1. a $\sqrt{4} = 2$

b $\sqrt{27} = \sqrt{9}\cdot\sqrt{3} = 3\sqrt{3}$

c $\sqrt{72} = \sqrt{36}\cdot\sqrt{2} = 6\sqrt{2}$

d $\sqrt{32} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$

e $\sqrt{98} = \sqrt{49}\sqrt{2} = 7\sqrt{2}$

f $\sqrt{200} = \sqrt{100}\sqrt{2} = 10\sqrt{2}$

2a $5\sqrt{18} \to 5\cdot\sqrt{9}\cdot\sqrt{2} = 5\cdot 3\sqrt{2} = 15\sqrt{2}$

b $\sqrt{4+9} \to \sqrt{13}$

c $\sqrt{3^2+4^2} \to \sqrt{9+16} \to \sqrt{25} = 5$

d $\sqrt{5^2+12^2} \to \sqrt{25+144} \to \sqrt{169} = 13$

e $\frac{1}{6}\sqrt{48} \to \frac{1}{6}\sqrt{16}\sqrt{3} = \frac{1}{6}\cdot 4\sqrt{3} = \frac{2}{3}\sqrt{3}$

f $\sqrt{49\cdot 3} \to \sqrt{49}\sqrt{3} = 7\sqrt{3}$

Get radicals out of basement!

3a $\frac{1}{\sqrt{2}}\frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{4}} = \frac{\sqrt{2}}{2}$

3b. $\frac{1}{\sqrt{5}}\frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

3c $\frac{4}{\sqrt{2}}\frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$

9.2: 2 $\frac{90}{360}(\pi\ 10) = \frac{1}{4}\ 10\ \pi = \frac{5}{2}\pi$

Chapter 9 THE PYTHAGOREAN THEOREM

Pages 368–369 (Section 9.1)

1 a 2 b $3\sqrt{3}$ c $6\sqrt{2}$ d $4\sqrt{2}$ e $7\sqrt{2}$ f $10\sqrt{2}$ g $2\sqrt{5}$ h $2\sqrt{6}$

2 a $5\sqrt{9}\sqrt{2} = 15\sqrt{2}$ b $\sqrt{13}$ c $\sqrt{9+16} = \sqrt{25} = 5$

d $\sqrt{25+144} = \sqrt{169} = 13$ e $\frac{1}{6} \cdot 4\sqrt{3} = \frac{2\sqrt{3}}{3}$ f $7\sqrt{3}$

3 a $\frac{\sqrt{2}}{2}$ b $\frac{\sqrt{5}}{5}$ c $2\sqrt{2}$ d $2\sqrt{3}$ **4** a $11\sqrt{3}$ b $8\sqrt{2} + 7\sqrt{3}$

c $2\sqrt{3} + 3\sqrt{3} = 5\sqrt{3}$ d $6\sqrt{2} + 5\sqrt{3} - 4\sqrt{3} = 6\sqrt{2} + \sqrt{3}$ **5** a ± 5

b ± 12 c ± 13 d $\pm\frac{1}{2}$ e $\pm 2\sqrt{3}$ f $\pm 3\sqrt{2}$ **6** a $x^2 = 9$, $x = \pm 3$

b $x^2 = 64$, $x = \pm 8$ c $x^2 = 25$, $x = \pm 5$ d $x^2 + 27 = 36$, $x^2 = 9$, $x = \pm 3$ e $5 + 11 = x^2$, $16 = x^2$, $x = \pm 4$ f $x^2 = 75 + 5$, $x^2 = 80$, $x = \pm\sqrt{16 \cdot 5} = \pm 4\sqrt{5}$

7 a $(x-6)(x+1) = 0$
$x = 6, -1$

b $(x+6)(x-2) = 0$
$x = -6, 2$

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

d $(x-6)(x+3) = 0$
$x = 6, -3$

e $x^2 - 9x - 36 = 0$
$(x-12)(x+3)$
$x = 12, -3$

f $(-x+9)(x+4) = 0$
$x = 9, -4$

8 a $x(x-4) = 0$
$x = 0, 4$

b $x^2 - 10x = 0$
$x(x-10) = 0$
$x = 0, 10$

c $x^2 - 13x = 0$
$x(x-13) = 0$
$x = 0, 13$

d $0 = x^2 - 8x$
$0 = x(x-8)$
$x = 0, 8$

9 a $x^2 + (21)^2 = (29)^2$
$x^2 = 841 - 441 = 400$
$x = 20$

b $(2)^2 + y^2 = (4)^2$
$y^2 = 16 - 4$
$y^2 = 12 = 4 \cdot 3$
$y = 2\sqrt{3}$

c $(4.1)^2 + (7.1)^2 = r^2$
$16.81 + 50.41 = r^2$
$67.22 = r^2$
$8.2 \approx r$

10 a $2x^2 - 3x - 35 = 0$
$(2x+7)(x-5) = 0$
$x = 5, -\frac{7}{2}$

b $12x^2 - 15 = -11x$
$12x^2 + 11x - 15 = 0$
$x = \frac{-11 \pm \sqrt{121 - 4(12)(-15)}}{24}$
$x = \frac{-11 \pm \sqrt{121 + 720}}{24}$
$x = \frac{-11 \pm 29}{24}$
$x = \frac{-5}{3}$ or $x = \frac{3}{4}$

c $8x^2 - 7x + 9 = 2x^2 + 6x + 7$
$6x^2 - 13x - 2 = 0$
$x = \frac{13 \pm \sqrt{169 - 4(6)(2)}}{12}$
$x = \frac{13 \pm \sqrt{121}}{12}$
$x = \frac{13 \pm 11}{12}$
$x = 2$ or $x = \frac{1}{6}$

11 $7(3x-3) = (x+1)(2x+4)$
$21x - 21 = 2x^2 + 6x + 4$
$0 = 2x^2 - 15x + 25$
$0 = (2x-5)(x-5)$
$x = \frac{5}{2}, 5$

12 OB = 10
OA = 7
$(OA)^2 + (OB)^2 = (AB)^2$
$100 + 49 = (AB)^2$
$12.2 \approx AB$

13 a $|h| = -h$ since $h < 0$ b $|x-3| = 3 - x$ since $x < 3$

c $|p|\,|q| = (-p)(-q) = pq$ since $p < 0$ and $q < 0$

d $|x|\,|y|\sqrt{x} = -xy\sqrt{x}$ since $x > 0$ and $y < 0$

The quadratic formula may be used to solve any quadratic of the form $ax^2 + bx + c = 0$.
Then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.