5.4 ex $t^2 - 16$ ← difference of 2 squares

$(t+4)(t-4)$ ← conjugates

ex $q^2 - \frac{1}{4} = (q + \frac{1}{2})(q - \frac{1}{2})$

ex $k^2 + 49$ prime (sum of 2 squares)

ex $4x^2 - 9 = (2x-3)(2x+3)$

ex $r^4 - 25 = (r^2 - 5)(r^2 + 5)$

ex $16k^4 - 1 = (4k^2+1)(4k^2-1)$

$= (4k^2+1)(2k-1)(2k+1)$

ex $p^2+4p+4 = (p+2)(p+2)$ or $(p+2)^2$

ex $m^2+\frac{2}{3}m+\frac{1}{9} = (m+\frac{1}{3})(m+\frac{1}{3})$ or $(m+\frac{1}{3})^2$

ex $4z^2-12zw+9w^2 = (2z+3w)^2$

ex $9r^3+6r^2+16r = r(9r^2+6r+16)$

prime

Sep 5-11:15 AM

#59-82 show up in Intermediate Algebra

ex $m^3 - 8 = (m - 2)(m^2 + 2m + 4)$

S O AP

Same opposite always Positive

ex $b^3 + 1 = (b + 1)(b^2 - b + 1)$

5.5 ex $(x-1)(x+8)=0$

$x-1=0$ or $x+8=0$

$x=1$ or $x=-8$

$\{1,-8\}$

ex $p^2+8p+7=0$ $(p+1)(p+7)=0$

$p+1=0$ $p+7=0$

$p=-1$ $p=-7$

$\{-1,-7\}$

Sep 5-11:20 AM

ex $t^2 = 2t + 15$

$-2t \quad -2t \quad -15$

-15

$t^2 - 2t - 15 = 0$

$(t-5)(t+3) = 0$

$t - 5 = 0 \qquad t + 3 = 0$

$t = 5 \qquad t = -3$

$\{5, -3\}$

ex $p^2 - 2p = 3$

$-3 \quad -3$

$p^2 - 2p - 3 = 0$

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

$p - 3 = 0 \qquad p + 1 = 0$

$p = 3 \qquad p = -1$

$\{-1, 3\}$

Sep 5-11:22 AM

ex $6r^2 - r - 2 = 0$

M $(6)(-2) = -12$

A $-1 = -4 + 3$

R $6r^2 - 4r + 3r - 2$

F $2r(3r-2) + 1(3r-2)$

F $(3r-2)(2r+1)$

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

$3r - 2 = 0 \quad 2r + 1 = 0$

$\frac{3r}{3} = \frac{2}{3} \quad \frac{2r}{2} = \frac{-1}{2}$

$r = \frac{2}{3} \quad r = -\frac{1}{2}$

$\{-\frac{1}{2}, \frac{2}{3}\}$

ex $x^2 = 400$

$-400 \quad -400$

$x^2 - 400 = 0$

$(x-20)(x+20) = 0$

$x - 20 = 0 \quad x + 20 = 0$

$x = 20 \quad x = -20$

$\{20, -20\}$

Sep 5-11:23 AM

ex $t^2 = 9t$

$-9t \quad -9t$

$t^2 - 9t = 0$

$t(t-9) = 0$

$t = 0 \quad t - 9 = 0$

$t = 0 \quad t = 9$

$\{0, 9\}$

ex $t(3t - 20) = -12$

$3t^2 - 20t = -12$

$+12 \quad +12$

$3t^2 - 20t + 12 = 0$

M $(3)(12) = 36$

A $-20 = \underline{-2} + \underline{(-18)}$

R $3t^2 - 2t - 18t + 12$

F $t(3t-2) - 6(3t-2)$

F $(3t-2)(t-6)$

$(3t-2)(t-6) = 0$

$3t - 2 = 0 \quad t - 6 = 0$

$3t = 2 \quad t = 6$

$t = \frac{2}{3}$

$\{6, \frac{2}{3}\}$

Ex $y^3 - 6y^2 + 8y = 0$

$y(y^2 - 6y + 8) = 0$

$y(y-2)(y-4) = 0$

$y = 0 \quad y - 2 = 0 \quad y - 4 = 0$

$y = 0 \quad y = 2 \quad y = 4$

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ex $(x-7)^2 + x^2 = (x+1)^2$

$x^2 - 14x + 49 + x^2 = x^2 + 2x + 1$

$-2x \quad -1 \quad -x^2 \quad -x^2 - 2x - 1$

$x^2 - 16x + 48 = 0$

$(x-4)(x-12) = 0$

$x - 4 = 0 \quad x - 12 = 0$

$x = 4 \quad x = 12$

$\{4, 12\}$

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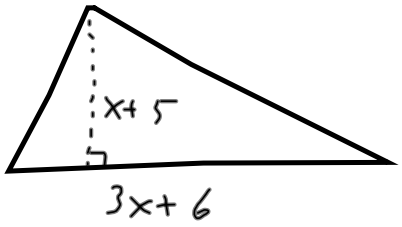
5.6 ex



$\frac{1}{2}\ b\ \ h\ \ = A$

$\frac{1}{2}(3x+6)(x+5) = 60$

$\frac{1}{2}(3x^2+15x+6x+30) = 60$

$\cdot 2 \qquad \cdot 2$

$3x^2+15x+6x+30 = 120$

$3x^2+21x+30 = 120$

$-120 \quad -120$

$\frac{3x^2}{3} + \frac{21x}{3} - \frac{90}{3} = \frac{0}{3}$

$x^2+7x-30 = 0$

$(x+10)(x-3) = 0$

$x+10=0 \qquad x-3=0$

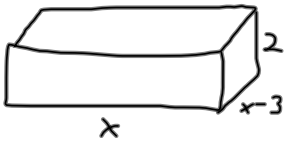
$x = -10 \qquad x = 3$

base: $3(3)+6 = 15$

height: $3+5 = 8$

Sep 5-11:35 AM

ex A toolbox: 2 ft high
width is 3ft less than its length



Volume = $80 ft^3$

Find length & width.

$V = lwh$

$80 = (x)(x-3)(2)$

$80 = 2x(x-3)$

$80 = 2x^2 - 6x$

$-80 \quad -80$

$0 = 2x^2 - 6x - 80$

$\frac{0}{2} = \frac{2x^2}{2} - \frac{6x}{2} - \frac{80}{2}$

$x^2 - 3x - 40 = 0$

$(x-8)(x+5) = 0$

$x-8=0 \quad x+5=0$

$x = 8 \quad x = -5$

length = 8 ft.

width = 8 - 3 = 5 ft.

ex The product of the 1st & 3rd of 3 consecutive integers is 3 more than 3 times the second. Find the integers.

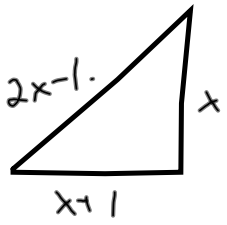
x = 1st
$x+1$ = 2nd
$x+2$ = 3rd

$$x(x+2) = 3 + 3(x+1)$$
$$x^2 + 2x = 3 + 3x + 3$$
$$x^2 + 2x = 3x + 6$$
$$-3x \quad -3x \quad -6$$
$$-6$$
$$x^2 - x - 6 = 0$$
$$(x-3)(x+2) = 0$$

$x-3=0$ $\quad$ $x+2=0$
$x=3$ $\quad$ $x=-2$
$x+1=4$ $\quad$ $x+1=-1$
$x+2=5$ $\quad$ $x+2=0$

3, 4, 5 or 0, -1, -2

ex



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

$$x^2 + x^2 + 2x + 1 = 4x^2 - 4x + 1$$
$$-x^2 \quad -x^2 \quad -2x - 1 \quad -x^2 \quad -2x - 1$$
$$-x^2$$

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

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

$$2x = 0 \qquad x - 3 = 0$$

$$x = 0 \qquad x = 3$$

shorter leg: 3 m