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EXERCISES.

[1.1] $3x^2 - 5x - 2$

[1.2] $a^2 - 11a + 24$

[1.3] $x^2 + 4xy + y^2$

[1.4] $a^2 - 36b^2$

[1.5] $4a^2 - 28a + 49$

[1.6] $25x^2 + 20x + 3$

[2.1] $(50+2)^2 = 2500 + 200 + 4 = 2704$

[2.2] $(100-2)^2 = 10000 - 400 + 4 = 9604$

[2.3] $(100+3)(100-3) = 10\,000 - 9 = 9991$

[2.4] $(5 - .1)(5 + .1) = 25 - .01 = 24.99$

[3.1] $(a+1)^2 - (a-1)^2$

$= a^2 + 2a + 2 - a^2 + 2a - 1$

$= 4a$

[3.2] $(x-3)^2 - [x - 3(x+3)]$

$= x^2 - 6x + 9 - [x - 3x - 9]$

$= x^2 - 6x + 9 + 2x + 9$

$= x^2 - 4x + 18$

TYPO in Question, so this is a guess at what the question might have been.

→

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[3.3] $(a+2b-3)(a+2b+3)$

$$= [(a+2b)-3][(a+2b)+3]$$

$$= (a+2b)^2 - 9$$

$$= a^2+4ab+4b^2-9$$

[3.4] $(x-y+5)^2$

$$= [(x-y)+5]^2$$

$$= (x-y)^2 + 10(x-y) + 25$$

$$= x^2-2xy+y^2-10x-10y+25$$

[4.1] $(\sqrt{5}+\sqrt{7})(\sqrt{5}-\sqrt{7}) = 5-7 = -2$

[4.2] $(2-\sqrt{3})^2 = 4-4\sqrt{3}+3 = 7-4\sqrt{3}$

[4.3] $(2\sqrt{3}+5)(2\sqrt{3}-7)$

$$= 12-4\sqrt{3}-35$$

$$= 23-4\sqrt{3}$$

[4.4] $\left[2-\frac{1}{\sqrt{3}}\right]\left[2+\frac{1}{\sqrt{3}}\right] = 4-\frac{1}{3} = \frac{11}{3}$

[4.5] $(\sqrt{5}+\sqrt{2})^2 - 2\sqrt{10}$

$$= 7+2\sqrt{10}-2\sqrt{10}$$

$$= 7$$

[5] $(\sqrt{2}-1)^2 + 3(\sqrt{2}-1)+1$

$$= 3-2\sqrt{2}+1+3\sqrt{2}-3+1$$

$$= 1-\sqrt{2}$$

[6.1]

Prove $AM = \frac{a}{2} + \frac{b}{2}$

<u>Proof</u>

$M$ is midpoint of $AE = a+b$. So, $AM = \frac{1}{2}(a+b) = \frac{a}{2} + \frac{b}{2}$.

□

Prove $MB = \frac{a}{2} - \frac{b}{2}$

<u>Proof</u>

$AE = AM + MB + BE$.

$AE = a+b$
$BE = b$
$AM = \frac{1}{2}(a+b)$

$a+b = \frac{1}{2}(a+b) + MB + b$

$M = \frac{1}{2}(a+b) - b$

$= \frac{a}{2} - \frac{b}{2}$

□

P38, ctd

[6,2] Prove $2(AM^2 + MB^2) = a^2 + b^2$

$$AM^2 = \left[\frac{a}{2} + \frac{b}{2}\right]^2 = \frac{a^2}{4} + \frac{ab}{2} + \frac{b^2}{4}$$

$$MB^2 = \left[\frac{a}{2} - \frac{b}{2}\right]^2 = \frac{a^2}{4} - \frac{ab}{2} + \frac{b^2}{4}$$

$$AM^2 + MB^2 = \frac{a^2}{4} + \frac{ab}{2} + \frac{b^2}{4} + \frac{a^2}{4} - \frac{ab}{2} + \frac{b^2}{4}$$

$$= \frac{a^2}{2} + \frac{b^2}{2}$$

So $2(AM^2 + MB^2) = 2\left[\frac{a^2}{2} + \frac{b^2}{2}\right]$

$$= a^2 + b^2$$

which is exactly what we wished to show.

$\square$