

SBHS - YEAR 10 QUADRATICS MARCH 2007

NAME : _____

1. Solve:
a) $(a + 4)(a - 9) = 0$

b) $(3x - 2)(4x + 5) = 0$

2. Simplify $\frac{m^2 - m}{m^2 - 1}$

3. Write as a single simplified fraction $\frac{1}{1 - x^2} + \frac{1}{1 + x}$

4. Solve
a) $b^2 + 7b + 12 = 0$

(b) $8x^2 - 10x - 3 = 0$

(c) $x^2 = 1$

(d) $x^2 - 49 = 9$

(e) $7d - d^2 = 0$

Solve by completing the square:

(a) $x^2 + 2x - 5 = 0$

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

6. Solve by using the quadratic formula

(a) $8x^2 - 34x + 21 = 0$

(b) $3x^2 + 9x + 5 = 0$

7. At present Mark is x^2 years old and Peter's age is x years. When Mark is $10x$ years Peter will be $2x$ years old. Write a quadratic equation in x to describe this information. Solve the equation to find their ages now.

$av = 30$

Solve by completing the square:

1. Solve: $(a+4)(a-9) = 0$ $a = 9$, or -4

b) $(3x-2)(4x+5) = 0$ $x = 2/3$, or $-5/4$

2. Simplify $\frac{m^2 - m}{m^2 - 1} \div \frac{m}{m+1}$ $= \frac{m}{m+1}$

3. Write as a single simplified fraction $\frac{1}{1-x^2} + \frac{1}{1+x}$ $= \frac{1+(1-x)}{(1+x)(1-x)}$

$\frac{2-x}{(1+x)(1-x)}$

4. Solve $b^2 + 7b + 12 = 0$
 $b^2 + 3b + 4b + 12 = 0$
 $b(b+3) + 4(b+3) = 0$
 $(b+3)(b+4) = 0$
 $b = -4$, or -3

(b) $8x^2 - 10x - 3 = 0$

$8x^2 + 2x - 12x - 3 = 0$
 $2x(4x+1) - 3(4x+1) = 0$
 $(4x+1)(2x-3) = 0$
 $x = -1/4$, or $3/2$

(c) $x^2 = 1$ $x = \pm 1$

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(d) $x^2 - 49 = 9 \rightarrow x^2 - 40 = 0$
 $(x+7)(x-7) = 9$
 $(x+\sqrt{40})(x-\sqrt{40}) = 0$
 $x = -\sqrt{40}$ or $\sqrt{40} = \pm 2\sqrt{10}$

(a) $x^2 + 2x - 5 = 0$

$x^2 + 2x = 5$

$x^2 + 2x + 1 = 6$

$(x+1)^2 = 6$

$x+1 = \pm \sqrt{6}$

$x = \pm \sqrt{6} - 1 = \sqrt{6} - 1$, or $-\sqrt{6} - 1$

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

$x^2 - x = 1/3$

$(x - 1/2)^2 = 1/3 + 1/4 = 7/12$

$x - 1/2 = \pm \sqrt{7/12}$

$x = 1/2 \pm \sqrt{7/12}$

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$x = \sqrt{7/12} - 1/2$, or $-\sqrt{7/12} - 1/2$

Solve by using the quadratic formula

(a) $8x^2 - 34x + 21 = 0$

$x = \frac{34 \pm \sqrt{1156 - 672}}{16} = \frac{34 \pm 22}{16} = \frac{56}{16} = 3 1/2$, or $\frac{12}{16} = 3/4$

(b) $3x^2 + 9x + 5 = 0$

$x = \frac{-9 \pm \sqrt{81 - 60}}{6} = \frac{-9 \pm \sqrt{21}}{6}$ $x = \frac{-9 + \sqrt{21}}{6}$ or $\frac{-9 - \sqrt{21}}{6}$

7. At present Mark is x^2 years old and Peter's age is x years. When Mark is $10x$ years Peter will be $2x$ years old. Write a quadratic equation in x to describe this information. Solve the equation to find their ages now.

$x^2 - x = 8x$

$x^2 - 9x = 0$

$x^2 - 9x + (9/2)^2 = 81/4$

$(x - 9/2)^2 = 81/4$

$x - 9/2 = \pm \sqrt{81/4}$

Mark is currently 81
 Peter is currently 9

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