Name:_____

Mark you are aiming for:_____

Sydney Girls High School Mathematics Department
Year 10 Topic Test – Quadratic Equations

Time Allowed: 40 minutes. Simplify all answers fully. Show all working and units.

Question 1: Solve

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

ii) $(3t-4)(4t+3)=0$

Question 2: Complete the following perfect squares:

i) $(\_\_-\_\_)^2 = x^2 \_\_+9$

ii) $(\_\_+\_\_)^2 = \_\_+16m+16$

iii) $x^2-7x = (\_\_\ \_\_)^2$

Question 3: Factorise and solve:

i) $2x^2-8x=0$

ii) $6x^2-7x-20=0$

iii) $4x^2-1=0$

Question 4: Solve giving your answer to 2 decimal places.

i) $x^2-4x+1=0$

ii) $3x^2-9x+7=0$

Question 5: Solve, leaving your answer as a surd.

i) $3-17x=-5x^2$

ii) $\frac{4(x+2)}{x}=x+1$

Question 6: Read carefully:

The difference between a positive integer and its square is equal to 48 more than the integer. Find the integer.

Question 7: Read carefully:

A rectangle is 2cm longer than it is wide. If its **area** in cm^2 is equal to its **perimeter** in cm, find its dimensions to 2dp. (HINT- draw a diagram)

Name: Martin

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Question 1: Solve

i) $(x-3)(2-x)=0$ Quicker to say $x-3=0$, $2-x=0$; $x=3$ or $x=2$

$2x-x^2-6+3x$

$=5x-x^2-6=0$ ✓ Why this? $\frac{-5\pm\sqrt{25-24}}{-2}=\frac{-5\pm1}{-2}=0$

$x=3, x=2$

ii) $(3t-4)(4t+3)=0 \Rightarrow 3t-4=0$ or $4t+3=0$

$12t^2-7t-12=0$

$\frac{7\pm\sqrt{49+576}}{24}=0$

$\frac{7\pm\sqrt{25}}{24}=0$

$x=\frac{32}{24}, \frac{-18}{24}$ $x=1\frac{1}{3}, -\frac{3}{4}$

Question 2: Complete the following perfect squares:

i) $(x-3)^2=x^2-6+9$ ii) $(2m+4)^2=4m^2+16m+16$ iii) $x^2-7x+\frac{9}{4}=(x-\frac{3}{2})^2$

Question 3: Factorise and solve:

i) $2x^2-8x=0$

$2x(x-4)=0$ ✓

$x=0$ ✓

$x=4$

ii) $6x^2-7x-20=0$ $S=-7$, $P=-120$

$\frac{(6x-15)(6x+8)}{6}=0$

$\frac{3(2x-5)2(3x+4)}{6}=0$

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

$x=\frac{5}{2}$ $x=-1\frac{1}{3}$

iii) $4x^2-1=0$

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

$x=0.5$ ✓

$x=-0.5$ ✓

Question 4: Solve giving your answer to 2 decimal places.

i) $x^2-4x+1=0$

$\frac{4\pm\sqrt{16-4}}{2}$

$\frac{4\pm\sqrt{12}}{2}$ ✓

$x=3.73$ ✓

$x=0.27$ ✓

ii) $3x^2-9x+7=0$

$\frac{9\pm\sqrt{81-84}}{6}=0$

$\frac{9\pm\sqrt{-3}}{6}=0$

no solution

Question 5: Solve, leaving your answer as a surd.

i) $3-17x=-5x^2$

$5x^2+3-17x=0$

$\frac{17\pm\sqrt{289-60}}{10}=0$

$\frac{17\pm\sqrt{229}}{10}=0$

$x=\frac{17\pm\sqrt{229}}{10}$

ii) $\frac{4(x+2)}{x}=x+1$

$\frac{4x+8}{x}=x+1$

$4x+8=x^2+x$

$x^2-3x-8=0$ $x=\frac{3\pm\sqrt{41}}{2}$

$\frac{3\pm\sqrt{9+32}}{2}=0$

$\frac{3\pm\sqrt{41}}{2}=0$

Question 6: Read carefully:

The difference between a positive integer and its square is equal to 48 more than the integer. Find the integer.

$x-x^2=x+48$

$x^2-x=x+48$

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

$s=-2$ $p=-48$

$(x-8)(x+6)=0$

$x=8$

$x=-6$

$x+x^2=48+x$

$x^2-47x=0$

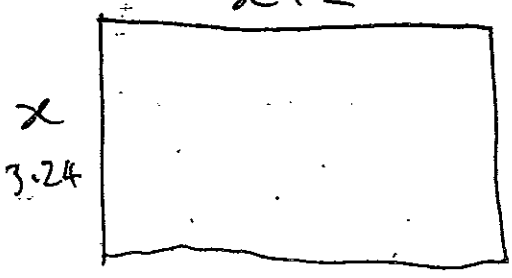
$x^2+x=48+x$

$x^2=48$

$x=\pm\sqrt{48}$

Question 7: Read carefully:

A rectangle is 2cm longer than it is wide. If its area in cm^2 is equal to its perimeter in cm, find its dimensions to 2dp. (HINT- draw a diagram)



$x^2+2x=4x+4$

$x^2-2x-4=0$

$\frac{2\pm\sqrt{4+16}}{2}=0$

$\frac{2\pm\sqrt{20}}{2}=0$

$x=3.24$

$=16.98\,cm^2$