Are there any Homework Questions you would like to see on the board?

Last day's work: Worksheet 1 – 6 [7,8]

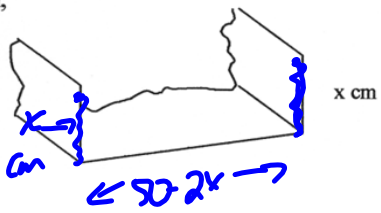
2, 4, 5, 6

pp. 198-199 #1c, 2ac, 3, 4ab, 5 – 8 [11]

Today's Homework Practice includes:
Review
pp. 202-203 #1 – 12, 13 – 17, 19 – 23

Wkst #6

6. A trough is made from a rectangular strip of sheet metal, 50 cm wide, by bending up at right angles a strip, x cm wide, along two sides. For what value of x is the cross section area a maximum?



$A = lw$

$= x(50-2x)$

$= 50x - 2x^2$

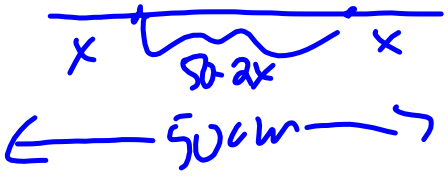
$= -2x^2 + 50x$

$= -2(x^2 - 25x)$

$= -2(x^2 - 25x + 156.25 - 156.25)$

$= -2(x-12.5)^2 + 312.50$

$\therefore$ if $x = 12.5$ cm the area is a max.



2a) $f(x) = -x^2+6x-5$ $g(x) = -4x+19$

Sub $g(x)$ in $f(x)$

$$-4x+19 = -x^2+6x-5$$

$$x^2-6x+5-4x+19=0$$

$$x^2-10x+24=0$$

$$(x-4)(x-6)=0$$

$\therefore x=4$ or $x=6$

$g(4) = -4(4)+19$

$= -16+19$

$= 3$

$\therefore (4,3)$ is a POI

$g(6) = -4(6)+19$

$= -24+19$

$= -5$

$\therefore (6,-5)$ is a POI

2c) $f(x)=3x^2-2x-1$, $g(x)=-x-6$

$3x^2-2x-1=-x-6$

$3x^2-2x-1+x+6=0$

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

$x=\frac{-(-1)\pm\sqrt{(-1)^2-4(3)(5)}}{2(3)}$

$=\frac{1\pm\sqrt{1-60}}{6}$

$=\frac{1\pm\sqrt{-59}}{6}$ $\Leftarrow$ ∴ No Real Solutions

3. # of P.O.I. w/out solving

$f(x) = 4x^2 + x - 3 \quad g(x) = 5x - 4$

$4x^2 + x - 3 = 5x - 4$

$4x^2 + x - 3 - 5x + 4 = 0$

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

$b^2 - 4ac$

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

$= 16 - 16$

$= 0$ ∴ there is one solution.

4b) $f(x)=3x^2-2 \qquad g(x)=x+7$

$3x^2-2=x+7$

$3x^2-2-x-7=0$

$3x^2-x-9=0$

$x=\frac{-(-1)\pm\sqrt{(-1)^2-4(3)(-9)}}{2(3)}$

$=\frac{1\pm\sqrt{1+108}}{6}$

$=\frac{1\pm\sqrt{109}}{6}$

$\therefore x=\frac{1+\sqrt{109}}{6}$ or $x=\frac{1-\sqrt{109}}{6}$

$\doteq 1.906 \qquad \doteq -1.573$

$\therefore y=1.906+7 \qquad y\doteq 5.426$

$=8.906$

$(1.906, 8.906), (-1.573, 5.426)$

5

5 Let x represent the smaller integer.
Let y represent the larger integer.

$x+2=y$

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

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

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

$2x+3=x^2$

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

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

$\therefore x=-1$ and $x=3$

$y=x+2$ $\quad$ $y=x+2$

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

$=1$ $\quad$ $=5$

Aside
$2L-1=S^2$

-1 and 1 or 3, 5

8) $g(x)=3x+k$ $f(x)=2x^2-5x+3$

find k if $b^2-4ac=0$ (1 POI)

$2x^2-5x+3=3x+k$

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

$2x^2-8x+3-k=0$

$a=2$ $b=-8$ $c=3-k$

$b^2-4ac=0$

$(-8)^2-4(2)(3-k)=0$

$64-8(3-k)=0$

$64-24+8k=0$

$40+8k=0$

$k=-5$

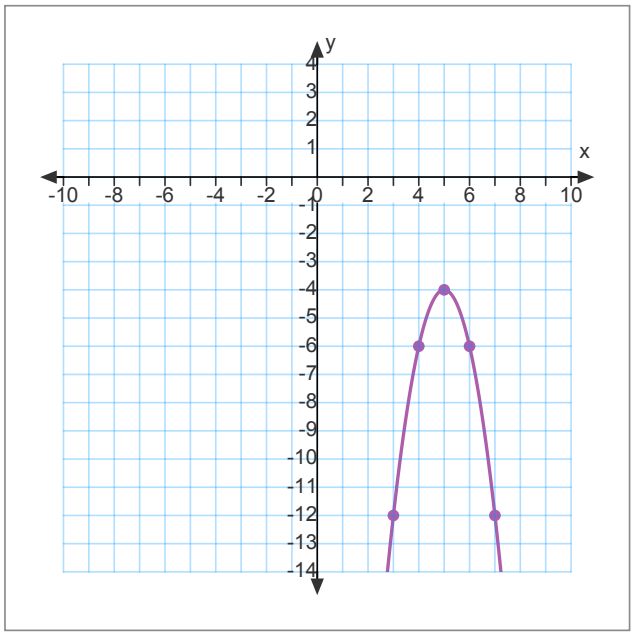
Quadratics Review

Date: _____

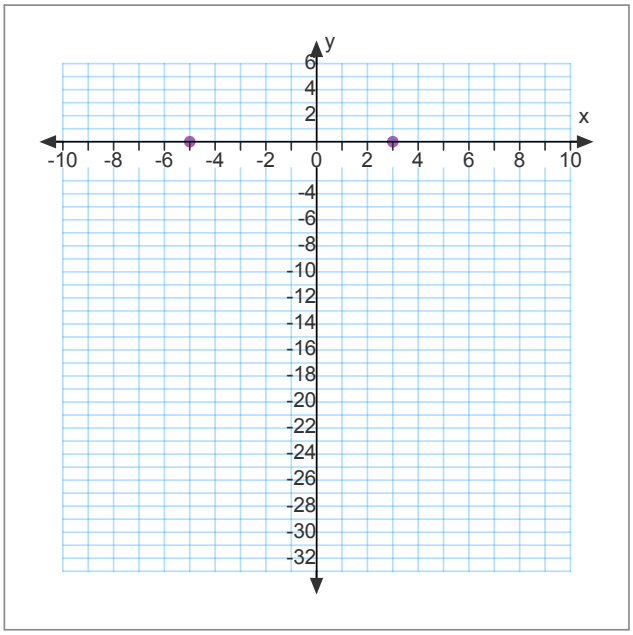
1. For each function below state the direction of the opening, the vertex, axis of symmetry, max or min value, and the domain and range. Finally, sketch the function.

a) $f(x) = -2(x-5)^2 - 4$

opens down
V(5, -4)
Ax S: x = 5
max. value is -4
D = {x ∈ ℝ}
R = {y ∈ ℝ / y ≤ -4}



b) $f(x) = 2(x-3)(x+5)$



$y = -2(x-5)^2 - 4$

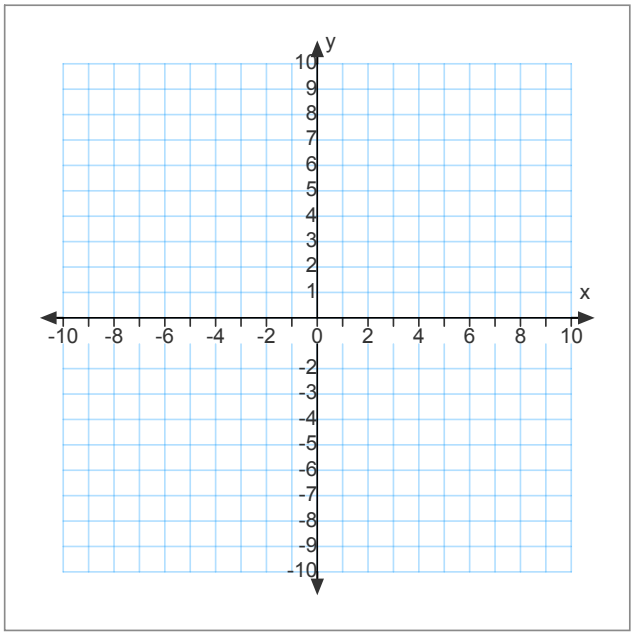
$y = 2(x-3)(x+5)$

2. a) The height, $h(t)$, in metres, of the tragectory of a football is given by $h(t) = 2 + 28t - 4.9t^2$, where t is the time in flight, in seconds. Determine the maximum height of the football and the time when that height is reached.

b) How long will it take for the ball to hit the ground?

3. a) Determine the inverse of $f(x) = -3(x-4)^2 + 2$

b) Graph $f(x)$ and $f^{-1}(x)$



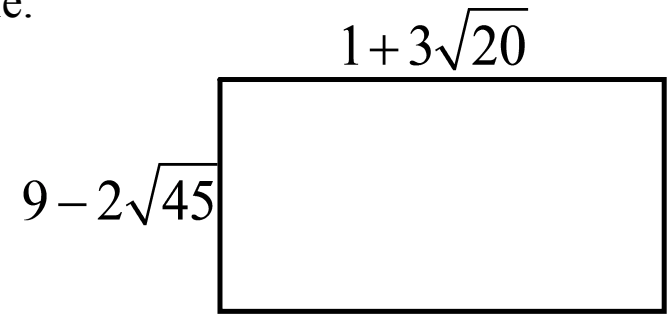
c) Is the inverse a function? Explain using words.

d) State the domain and range of $f(x)$ and $f^{-1}(x)$

4. Express each radical in simplest radical form.

a) $\sqrt{98}$ b) $-5\sqrt{50}$ c) $-2\sqrt{12}+4\sqrt{48}$

5. Determine an expression in lowest terms for the perimeter AND area of the rectangle.



6. a) The height, $h(t)$, of a projectile, in metres, can be modelled by the equation $h(t) = 14t - 5t^2$, where t is the time in seconds after the projectile is released. Can the projectile ever reach a height of 9 m?

b) How long will it take for it to hit the ground?

7. Determine the value(s) for k for which the function has no roots.

$$f(x) = 3x^2 - 4x + k$$

8. Determine the equation of parabola that has roots $\sqrt{5}$ and $-\sqrt{5}$ and goes through point (-1, 6).

9. Solve $f(x) = 3x^2 - 4x + 2$

Are there any Homework Questions you would like to see on the board?

Last day's work: Worksheet 1 – 6 [7,8]

pp. 198-199 #1c, 2ac, 3, 4ab, 5 8 [11]

Today's Homework Practice includes:
Review
pp. 202-203 #1 – 12, 13 – 17, 19 – 23