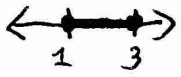
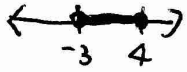
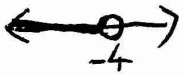
HW 3, MATH 2

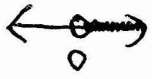
1.8

1)

a) $[1,3]$ 

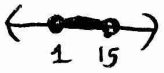
d) $[-3,4]$ 

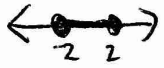
g) $(-\infty,-4)$ 

h) 

$(0,\infty)$

---

2) a) $[1,15)$ 

b) $[-2,2]$ 

c) $(-5,-3]$ 

---

3) a) $3 < x < 7$

b) $-4 < x \leq -1$

c) $x \leq 19$

d) $2 \leq x < 10$

3.1

1) $3x - 4 = 0$

$3x = 4$

$\boxed{x = \frac{4}{3}}$

---

3) $\frac{5}{12}x - 35 = 0$

$\frac{5}{12}x = 35$

$\frac{5}{12}x \cdot \frac{12}{5} = 35 \cdot \frac{12}{5}$

$x = 7 \cdot 12 = 84$

---

5) $\frac{4}{3}z - 1 = \frac{1}{10}$

$\frac{4}{3}z = \frac{1}{10} + 1$

$\frac{4}{3}z = \frac{11}{10}$

$\boxed{z = \frac{33}{40}}$

3.1 #9

$\frac{1}{2}y - \frac{1}{3} = \frac{1}{6} - 2y$

$\frac{1}{2}y + 2y = \frac{1}{6} + \frac{1}{3}$

$y(\frac{1}{2} + 2) = \frac{1}{6} + \frac{2}{6}$

$y(\frac{5}{2}) = \frac{1}{2}$

$y = \frac{1}{5}$

---

14) $2zy + 4z + y = 2 - y$

$2zy + y + y = 2 - 4z$

$y(2z + 1 + 1) = 2 - 4z$

$y(2z + 2) = 2 - 4z$

$y = \frac{2 - 4z}{2z + 2}$

$y = \frac{2(1 - 2z)}{2(z + 1)}$

$= \frac{1 - 2z}{z + 1}$

---

17) $2y^2x - y^2 - (1 + 3y) = x$

$2y^2x - x = y^2 + 1 + 3y$

$x(2y^2 - 1) = y^2 + 1 + 3y$

$x = \frac{y^2 + 1 + 3y}{2y^2 - 1}$

---

19) Let x be the number of dimes we have.

⇒ since we have 3 times as many quarters as dimes,

so the number of quarters is 3x.

Now, we want to figure out the number of nickles.

Note that the total number of coins = 27

so, if ▨ = # of nickles, then

# of dime + # of niches + # of quarters = 27

$\Rightarrow$ $x + \boxed{///} + 3x = 27$

$\Rightarrow$ ▨ $= 27 - 4x$

Now, we know that the following coins has these many number of coins.

type	number
dime	x
quarter	$3x$
nickle	$27-4x$

Now, the total value is \$3.30 which is \$330, so we have

$10 \cdot x + 25 \cdot 3x + 5 \cdot (27 - 4x) = 330$

$10x + 75x + 135 - 20x = 330$

$65x = 195$

$x = 3$

$\Rightarrow$ # of of nickles =

$27 - 4x = 27 - 4 \cdot 3$

$= \boxed{15}$

3.2 1)

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

$(x+4)(x+1) = 0$

$\boxed{x = -4, -1}$

---

3) $x^2 + 6x + 9 = 0$

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

$\boxed{x = -3}$

6) $\frac{x^2}{4} + 2x + 1 = 0$ $\times 4$

$x^2 + 8x + 4 = 0$

$x = \frac{-8 \pm \sqrt{8^2 - 4 \cdot 1 \cdot 4}}{2}$

$= \frac{-8 \pm \sqrt{64 - 16}}{2}$

$= \frac{-8 \pm \sqrt{48}}{2}$

$= \frac{-8 \pm \sqrt{4 \cdot 4 \cdot 3}}{2}$

$= \frac{-8 \pm 4\sqrt{3}}{2}$

$= -4 \pm 2\sqrt{3}$

$x = -4 + 2\sqrt{3}, \; -4 - 2\sqrt{3}$

#7 $y^2 - 2y + 2 = 0$

$y = \frac{2 \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot 2}}{2}$

$= \frac{2 \pm \sqrt{4 - 8}}{2}$

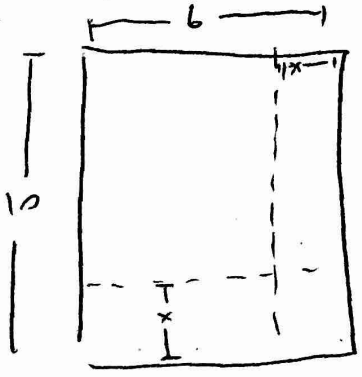
$= \frac{2 \pm \sqrt{-4}}{2}$

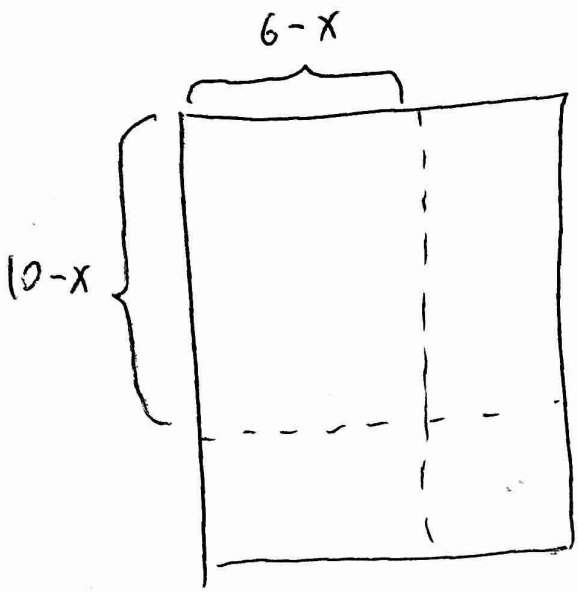
$= \frac{2 \pm 2i}{2}$

$y = 1 \pm i$

$y = 1 + i, \; 1 - i$

27) Let's x = the width of the strips.





So $(6-x)(10-x) = 60 - 15$

$60 - 16x + x^2 = 45$

$x^2 - 16x + 15 = 0$

$(x-15)(x-1) = 0$

$x = 1$ or $x = 15$

but $x = 15$ does not make sense since we cannot cut the rectangle that much.

So $\boxed{x = 1}$