

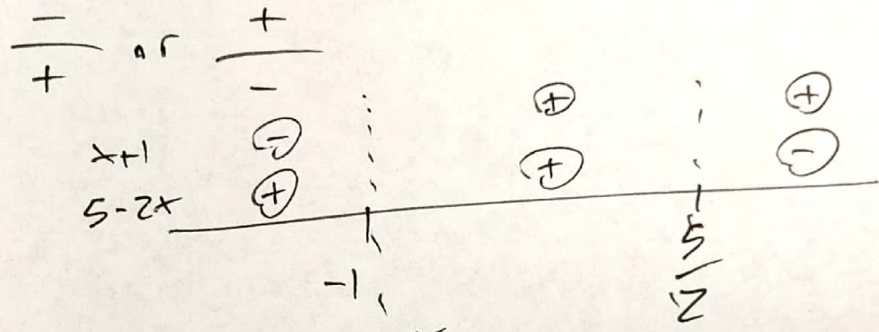
1) $\boxed{(-3, 5]}$

2) $3x - 7 \geq 2 \rightarrow x \geq \frac{2+7}{3} = 3$

$-(3x - 7) \geq 2 \rightarrow -3x + 7 \geq 2$
 $-3x \geq -5 \rightarrow x \leq \frac{5}{3}$

$\boxed{(-\infty, \frac{5}{3}] \cup [3, \infty)}$

3) $\frac{x+1}{5-2x} < 0$



$x < -1$ or $x > \frac{5}{2}$

$\boxed{(-\infty, -1) \cup (\frac{5}{2}, \infty)}$

4) $(\frac{-3+1}{2}, \frac{0+5}{2}) \rightarrow (-1, \frac{5}{2})$

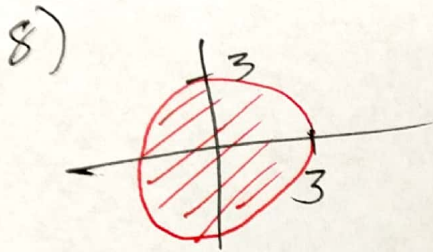
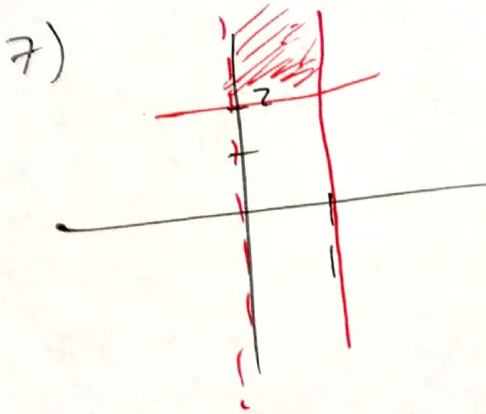
$\sqrt{(-3-1)^2 + (0-5)^2} = \sqrt{41}$

5) $x^2 + 4x + y^2 - 20y = 0$
 $(x+2)^2 + (y-10)^2 = 104$

$(-2, 10) \quad r = \sqrt{104}$

6) $0 = 8x^2 + x - 2$

$x = \frac{-1 \pm \sqrt{1 + 4 \cdot 8}}{16}$
 $= \frac{-1 \pm \sqrt{65}}{16}$



- 9)
- a) w.r.t. x-axis $y \rightarrow -y$
 - b) w.r.t. y-axis $x \rightarrow -x$
 - c) w.r.t. origin $x \rightarrow -x$ & $y \rightarrow -y$

10)

$$x^2 - 5x + 6 \geq 0$$

$$(x-6)(x+1) \geq 0$$

$x-6$	\ominus	\vdots	\oplus
$x+1$	\oplus	\vdots	\oplus
	-1		6

$x \leq -1$ or $x \geq 6$

11)

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

$$= \left(x - \frac{1}{2}\right)^2 - \frac{9}{4}$$

$$h\left(\frac{1}{2}\right) = \frac{1}{4} - \frac{1}{2} - 2$$

$$= -\frac{1}{4} - 2$$

$$= -\frac{9}{4}$$

-1		$\frac{1}{2}$

$\min = -\frac{9}{4}$

$\Rightarrow \text{Ran.} \Rightarrow y \geq -\frac{9}{4}$

12)

$$\left(\frac{1}{2}, -\frac{9}{4}\right)$$

13)

$$m = \frac{1+3}{-5-2} = -\frac{4}{7}$$

$$y = -\frac{4}{7}(x-2) - 3$$

14)

$$\frac{-5}{-2} \rightarrow m = -\frac{2}{5} \quad \text{so: } y = -\frac{2}{5}(x-1) + 2$$

$$15) y = x^2 \text{ to } \frac{1}{2}(x+3)^2 + 5$$

- 1) vertical shrink by factor of $\frac{1}{2}$
- 2) shift left 3
- 3) shift up 5

$$16) f(x) = 3x + 1$$

$$f(2) = |3 \cdot 2 + 1| = 7$$

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

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

$$17) f(x) = -3\left(x^2 + \frac{1}{3}x\right) + 2$$

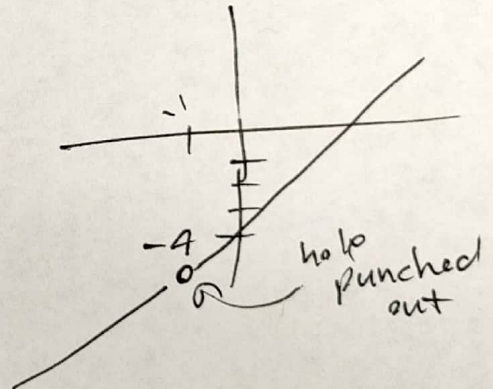
$$= -3\left(x + \frac{1}{6}\right)^2 + 2 + \frac{1}{36}$$

$$\text{max @ } 2 + \frac{1}{36} = \frac{73}{36} \text{ (max y-value)}$$

$$18) g(x) = \frac{(x-4)(x+1)}{(x+1)} = x - 4 \quad (x \neq -1)$$

$$D: x \neq -1$$

$$R: y \neq -5$$



$$19) y = 2(x+3)^2 - 2$$