

Review WS

① $4 - 3x > 7 + 2x$

$-3 > 5x$

$-3/5 > x$

$(-\infty, -3/5)$

② $\frac{7}{2} > \frac{1-4x}{5}$ $\frac{1-4x}{5} > \frac{3}{2}$

$\frac{35}{2} > 1-4x$ $1-4x > \frac{15}{2}$

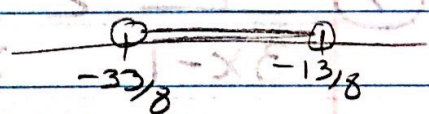
$4x > -33/2$

$-13/2 > 4x$

$x > -33/8$

$-13/8 > x$

$(-33/8, -13/8)$



③ $2x - 7 \leq .01$

$2x - 7 \geq -.01$

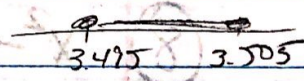
$2x \leq 7.01$

$2x \geq 6.99$

$x \leq 3.505$

$x \geq 3.495$

$(3.495, 3.505)$



④ $6x - 7 > 1$

$6x - 7 < -1$

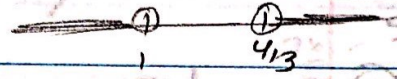
$6x > 8$

$6x < 6$

$x > 4/3$

$x < 1$

$(-\infty, 1) \cup (4/3, \infty)$



⑤ $2x^2 - 5x + 3 < 0$

$(2x + 1)(x - 3) < 0$

$2x + 1 < 0$

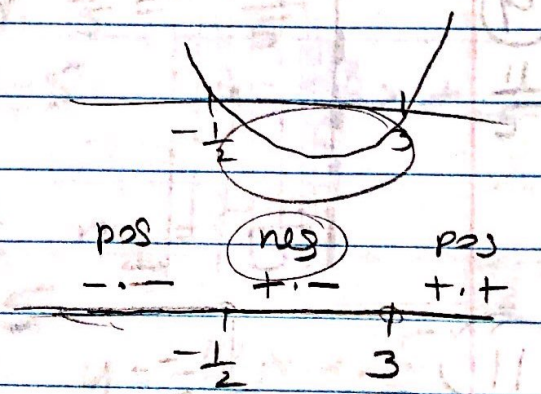
$x - 3 < 0$

$2x < -1$

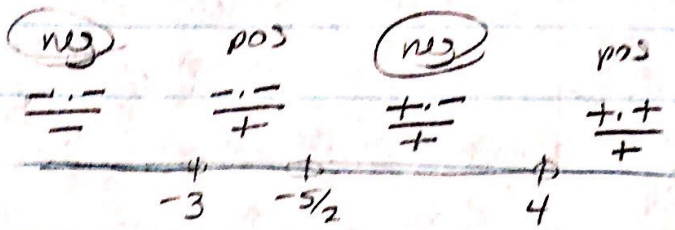
$x < 3$

$x < -1/2$

$(-1/2, 3)$



⑥ $\frac{2x^2 - 3x - 20}{x+3} < 0$



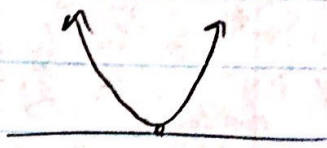
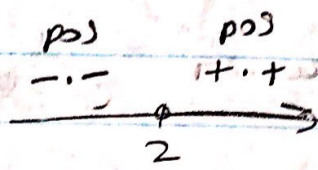
$(2x+5)(x-4)$
 $x+3$

$2x+5 < 0$ $x-4 < 0$ $x+3 < 0$
 $2x < -5$ $x < 4$ $x < -3$
 $x < -5/2$ $(-\infty, -3) \cup (-5/2, 4)$

⑦ $\frac{1}{3x-1} < \frac{2}{x+5}$

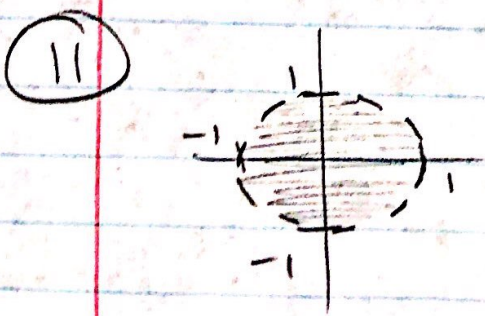
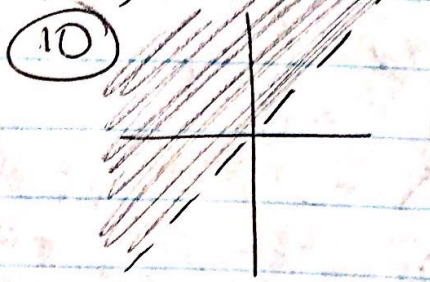
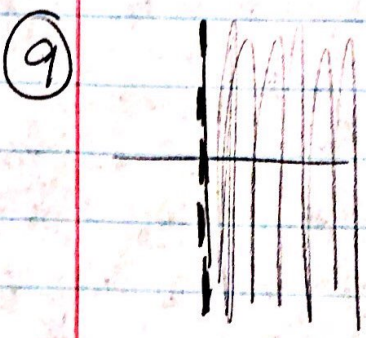
$x+5 < 6x-2$
 $7 < 5x$
 $7/5 < x$ $(7/5, \infty)$

⑧ $x^2 - 4x + 4 \geq 0$
 $(x-2)(x-2) \geq 0$

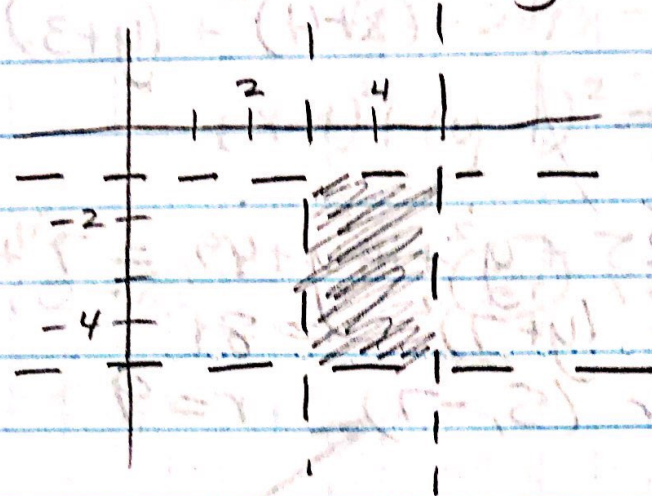


$x-2 \geq 0$
 $x \geq 2$

$(-\infty, \infty)$



12) $x-4 < 1$ $x-4 > -1$ $y+3 < 2$ $y+3 > -2$
 $x < 5$ $x > 3$ $y < -1$ $y > -5$



13) A(-4, 2) B(3, 6) C(2, -5)

13) $m_{AC} = \frac{-7}{-6} = \frac{7}{6}$ $m_{\perp} = \frac{7}{6}$ $-\frac{7}{2} + 6$

14) $y = \frac{7}{6}(x-3) + 6$ $y = \frac{7}{6}x + \frac{5}{2}$

14) $m_{\perp} = -\frac{6}{7}$

$y = -\frac{6}{7}(x-3) + 6$ $y = -\frac{6}{7}x + \frac{60}{7}$ $\frac{18}{7} + 6$

15) midpoint

$(-\frac{1}{2}, 4)$ slope = $-\frac{9}{5/2} = 9 \cdot \frac{2}{5} = \frac{18}{5}$ $\frac{36}{5} - 5$

$(2, -5)$ $y = -\frac{18}{5}(x-2) - 5$ $y = -\frac{18}{5}x + \frac{11}{5}$

16) $x = -4$

17) $3x - 10y = -7$ slope = $\frac{3}{10}$ $m_{\perp} = -\frac{10}{3}$ $\frac{20}{3} - 5$

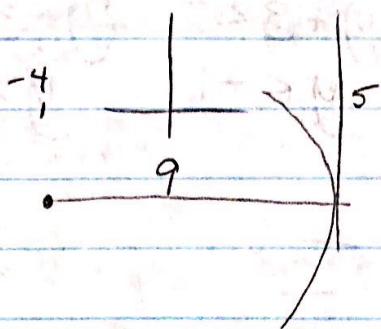
$y = -\frac{10}{3}(x-2) - 5$ $y = -\frac{10}{3}x + \frac{5}{3}$

18) $4^2 + 7^2 = r^2$

$65 = r^2$ $(x-4)^2 + (y+7)^2 = 65$

$\sqrt{65} = r$

(19)



$$r=9$$

$$(x+4)^2 + (y+3)^2 = 81$$

(21) $x^2 - 10x + 25 + y^2 + 14y + 49 = 7 + 25 + 49$
 $(x-5)^2 + (y+7)^2 = 81$
center $(5, -7)$ $r=9$

$$f(x) = \frac{1}{\sqrt{x+1}}$$

(30) $f(1) = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

(32) $f(0) = \frac{1}{\sqrt{1}} = 1$

(31) $f(3) = \frac{1}{\sqrt{4}} = \frac{1}{2}$

(33) $f(\sqrt{2}-1) = \frac{1}{\sqrt{\sqrt{2}-1+1}} = \frac{1}{\sqrt{\sqrt{2}}}$
 $= \frac{1}{2^{1/4}} = \frac{1}{\sqrt[4]{2}}$

(34) $f(-x) = \frac{1}{\sqrt{-x+1}}$

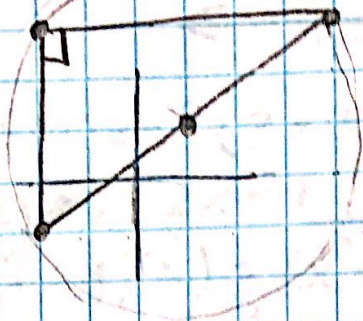
(35) $-f(x) = \frac{-1}{\sqrt{x+1}}$

(36) $f(x^2) = \frac{1}{\sqrt{x^2+1}}$

(37) $(f(x))^2 = \left(\frac{1}{\sqrt{x+1}}\right)^2 = \frac{1}{x+1}$

Review WS

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center (1,1)

$$4^2 + 6^2 = d^2$$

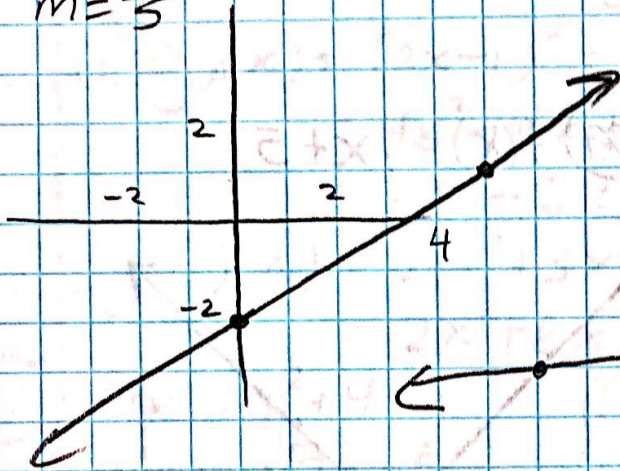
$$52 = d^2$$

$$\sqrt{52} = 2\sqrt{13} = d$$

$$r = \sqrt{13}$$

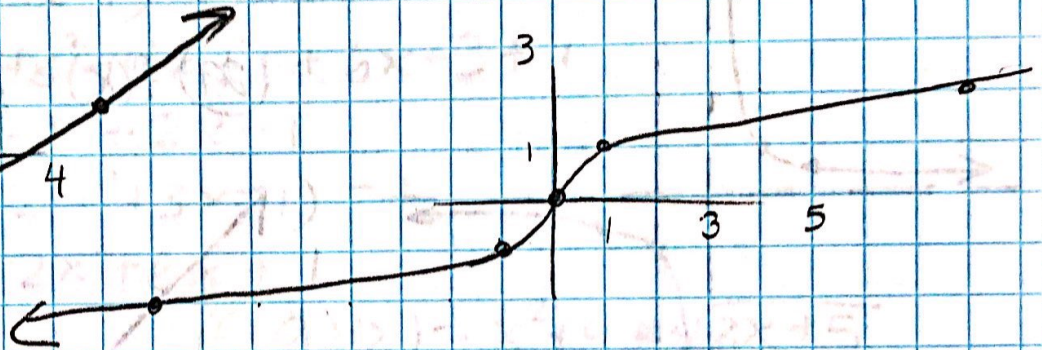
$$(x-1)^2 + (y-1)^2 = 13$$

22 $3x - 5y = 10$
 $(0, -2)$
 $m = \frac{3}{5}$

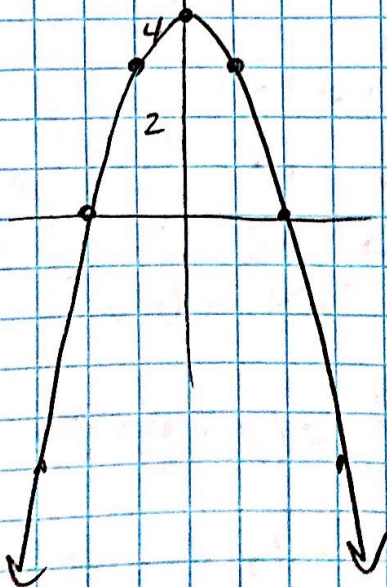


24 $x = y^3$

- 0,0
- 1,1
- 8,2

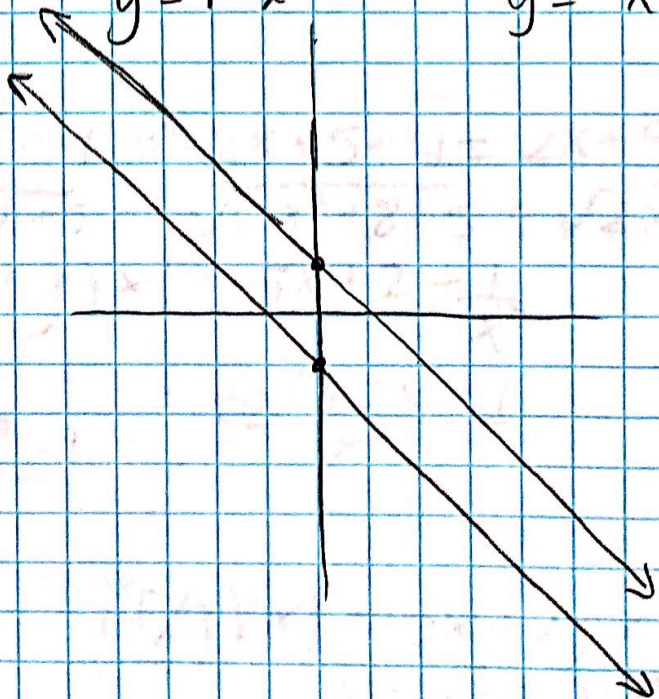


23 $y = 4 - x^2$



25 $x + y = 1$
 $y = 1 - x$

$x + y = -1$
 $y = -x - 1$



$$\begin{aligned} (38) \quad f(x) &= x^2 + 3x + 1 & (f+g)(x) &= x^2 + 5x \\ g(x) &= 2x - 1 & (f-g)(x) &= x^2 + x + 2 \\ (f \cdot g)(x) &= (x^2 + 3x + 1)(2x - 1) \\ &= 2x^3 + 6x^2 + 2x - x^2 - 3x - 1 \\ &= 2x^3 + 5x^2 - x - 1 \end{aligned}$$

$$(f/g)(x) = \frac{x^2 + 3x + 1}{2x - 1}$$

$$\begin{aligned} (f \circ g)(x) &= (2x - 1)^2 + 3(2x - 1) + 1 \\ &= 4x^2 - 4x + 1 + 6x - 3 + 1 \\ &= 4x^2 + 2x - 1 \end{aligned}$$

$$\begin{aligned} (g \circ f)(x) &= 2(x^2 + 3x + 1) - 1 \\ &= 2x^2 + 6x + 1 \end{aligned}$$

$$\begin{aligned} (39) \quad f(x) &= x^2 + 4 & (f+g)(x) &= x^2 + 4 + \sqrt{2x+5} \\ g(x) &= \sqrt{2x+5} & (f-g)(x) &= x^2 + 4 - \sqrt{2x+5} \\ (f \cdot g)(x) &= (x^2 + 4)\sqrt{2x+5} = x^2\sqrt{2x+5} + 4\sqrt{2x+5} \\ (f/g)(x) &= \frac{x^2 + 4}{\sqrt{2x+5}} \end{aligned}$$

$$(f \circ g)(x) = (\sqrt{2x+5})^2 + 4 = 2x + 5 + 4 = 2x + 9$$

$$(g \circ f)(x) = \sqrt{2(x^2 + 4) + 5} = \sqrt{2x^2 + 8 + 5} = \sqrt{2x^2 + 13}$$

$$\begin{aligned} (40) \quad f(x) &= 5x + 2 & (f+g)(x) &= 5x + 2 + \frac{1}{x^2} \\ g(x) &= \frac{1}{x^2} \end{aligned}$$

$$(f-g)(x) = \frac{5x^3 + 2x^2 - 1}{x^2} = \frac{5x^3 + 2x^2 + 1}{x^2}$$

$$\begin{aligned} (f \cdot g)(x) &= \frac{5x^2 + 2}{x^2} & (f/g)(x) &= (5x + 2)(x^2) \\ & & &= 5x^3 + 2x^2 \end{aligned}$$

40 cont

$$(f \circ g)(x) = 5\left(\frac{1}{x^2}\right) + 2 = \frac{5}{x^2} + 2 = \frac{5 + 2x^2}{x^2}$$

$$(g \circ f)(x) = \frac{1}{(5x+2)^2} = \frac{1}{25x^2 + 20x + 4}$$

① $f(x) = \frac{2x-3}{x(x-1)}$ $x \neq 0, 1$

$(-\infty, 0) \cup (0, 1) \cup (1, \infty)$

② $f(x) = \frac{x}{\sqrt{(4-x)(4+x)}}$ $(4-x)(4+x) > 0$

$$4-x > 0 \quad 4+x > 0$$

$$4 > x \quad x > -4$$

$[-4, 4]$

$$\begin{array}{c} - & + & - \\ | & & | \\ -4 & & 4 \end{array}$$

③ $f(x) = \frac{1}{\sqrt{x-5}\sqrt{7-x}}$

$(5, 7)$

$$x-5 > 0 \quad 7-x > 0$$

$$x > 5 \quad 7 > x$$

④ $f(x) = \frac{1}{\sqrt{x}(x-2)}$ $[0, \infty)$

⑤ $x = 5 - 7y$

$x - 5 = -7y$

$y = \frac{x-5}{-7}$

$f^{-1}(x) = -\frac{1}{7}x - \frac{5}{7}$

⑥ $x = 4y^2 + 3$

$x - 3 = 4y^2$

$\frac{x-3}{4} = y^2$

$y = \sqrt{\frac{x-3}{4}}$

$f^{-1}(x) = \frac{\sqrt{x-3}}{2}$