Sameer Ahmed

2. $\frac{6(x+1)}{x-3} = \frac{-5(x+1)}{x+1} + \frac{35(x+1)}{(x-3)(x+1)}$

$\frac{6x+6}{x-3} = -5 + \frac{35}{x-3}$

$6x+6 = -5x+15+35$

$6x+6 = -5x+50$

$\frac{11x}{11} = \frac{44}{11}$ $x = 4$

3. $18x^2-6x+1=0$

$\frac{6 \pm \sqrt{(-6)^2-4(18)(1)}}{2(18)}$

$\frac{6 \pm \sqrt{-36}}{36}$

$\frac{6 \pm 6i}{36}$

$= \frac{1 \pm i}{6}$

4. $3x^2-4x+7=0$

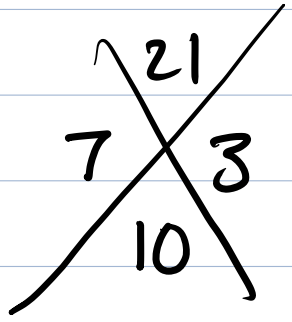
$\frac{4 \pm \sqrt{(-4)^2-4(3)(7)}}{2(3)}$

$$\frac{2(3)}{4 \pm \sqrt{-68}}$$
$$6$$

5. $\sqrt{2x+15} - 6 = x$

$$\left(\sqrt{2x+15}\right)^2 = (6+x)^2 \quad (6+x)$$

$$2x+15 = x^2+12x+36$$
$$-2x \quad -15$$
$$x^2+10x+21$$



$$(x+7)(x+3)$$
$$x = -7, -3$$

6. $|7-2x| > 9$

$-7+2x > 9$ $\qquad$ $7-2x < 9$

$\frac{2x}{2} > \frac{16}{2}$ $\qquad$ $-2x < 2$

$x > 8$ $\qquad$ $x < -1$

$$(-\infty, -1) \cup (8, \infty)$$

7. $f(x) = 3x+2 \quad g(x) = 7x-9$

$f(x) = \frac{3x+2}{} = 0$

$7x - 9 = 0$

$x = \frac{9}{7}$

8.

domain = $(-\infty, \infty)$

range = $(-1, \infty)$

right $\emptyset = 4$

y-int = 8

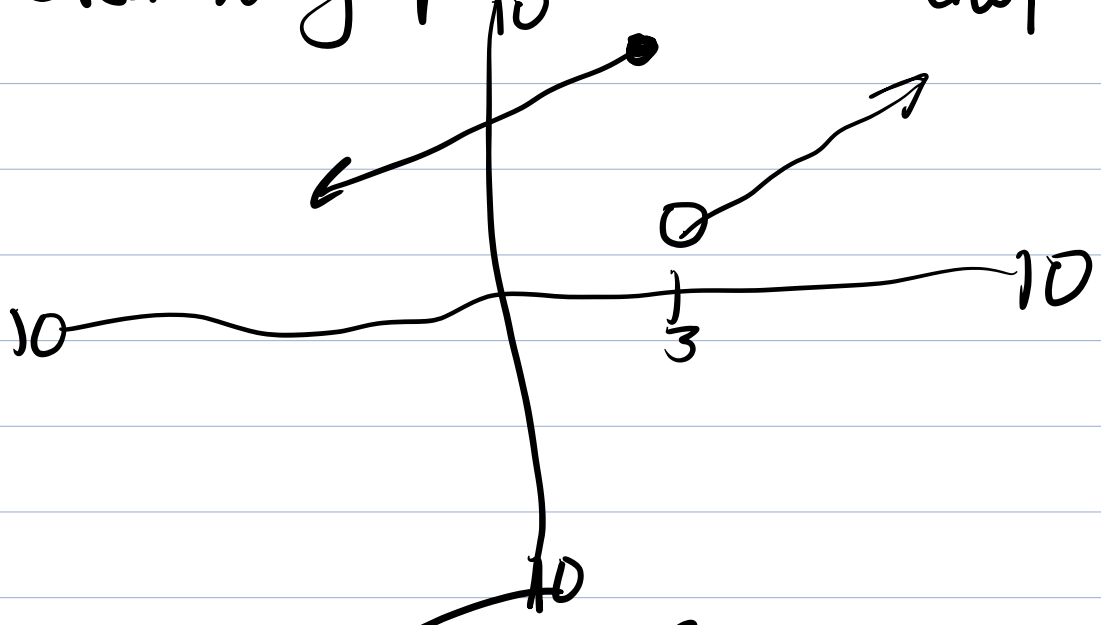
decreasing = $(0, 3)$

(f) # f rel min = -1

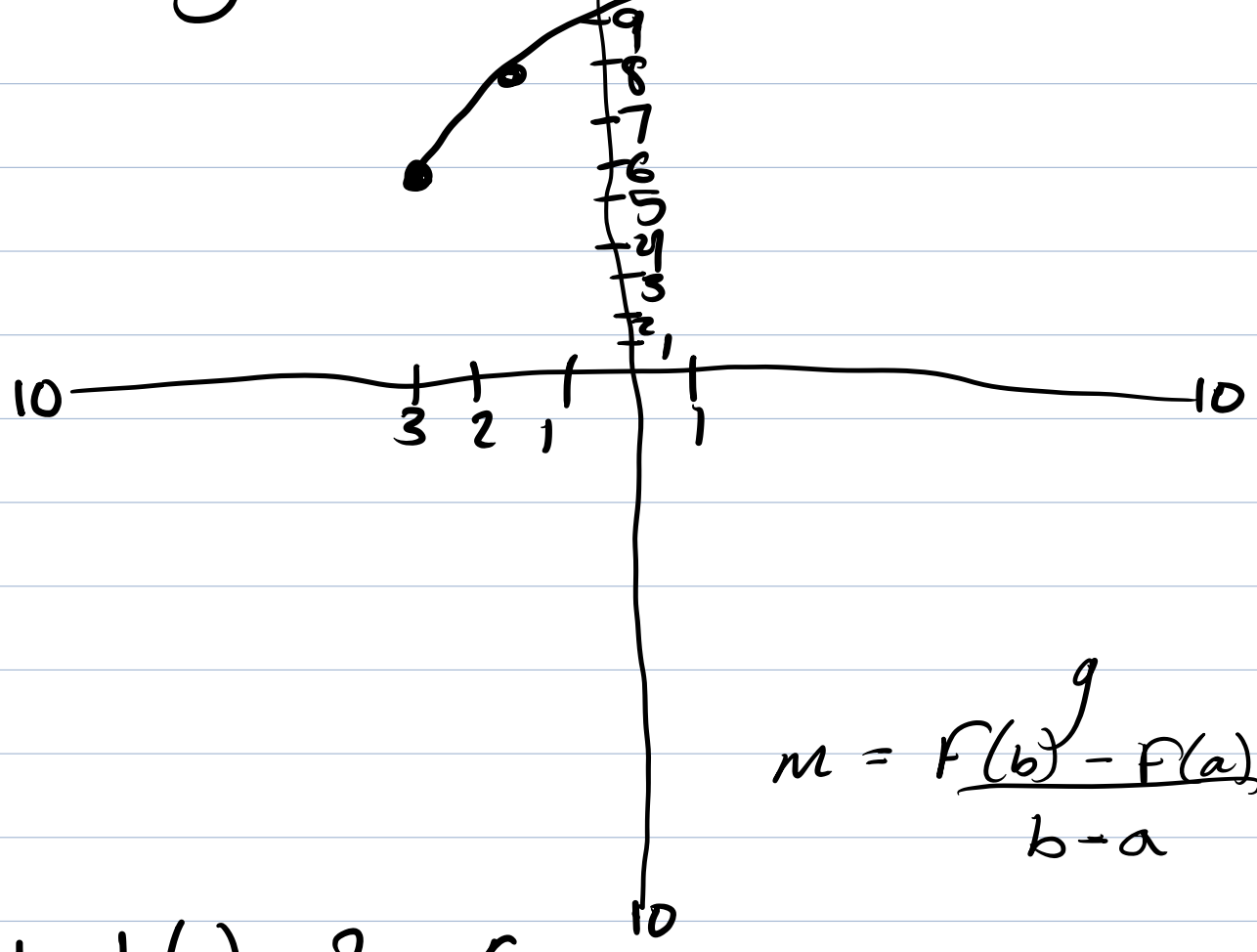
even

9. $f(x) = \begin{cases} x+5 & \text{if } x < 3 \\ x-5 & \text{if } x \geq 3 \end{cases}$

Sketch graph Label all endpoints



10. $g(x) = 2\sqrt{x+3} + 6$ Label 3 points



$$m = \frac{f(b) - f(a)}{b - a}$$

11. $h(x) = \underbrace{2x}_{\text{Slope}} + \underbrace{6}_{y\text{ int}}$

avg. rate of change: 2

increasing

12. $f(x) = x^2 - 4x - 5$

$\frac{4}{2} \Rightarrow 2$ $f(2)$

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

$$\frac{4 \pm \sqrt{36}}{2}$$

$$\frac{4 \pm 6}{2}$$

Vertex

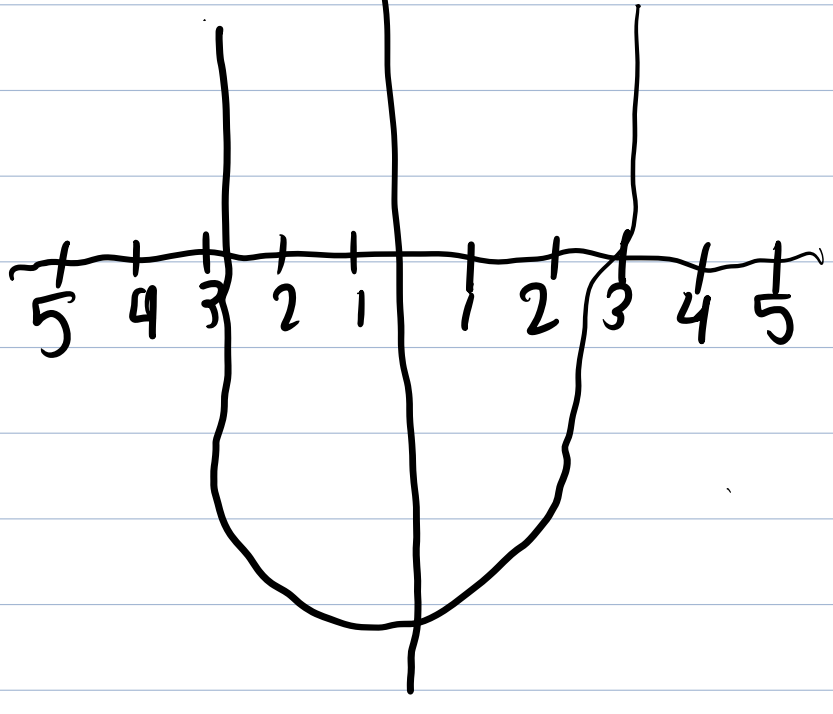
(2, -9)

axis of sym = x=2 $\frac{10}{2} = 5$ $\frac{-2}{2} = -1$

13. a)
b) -3, 3

$x^3 - 9x^2 + 18x + 36$
$x^3 - 6x^2 + 9 + 27 + 18x$
$-3x^2$
$(x^2 - 6x + 9)(x-3)$
$(x-3)(x-3)$
$-3(x+3)(x-3)^3$
$-3x - 9$

c) graph



14. $f(x) = \frac{x^2 - 8x + 14}{x}$

$\frac{8 \pm \sqrt{(-8)^2 - 4(4)(1)}}{2}$

VA = 0
No HA

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

-20
5 4

15. $\frac{x^2}{}$

$x^2 - x - 20$

-1

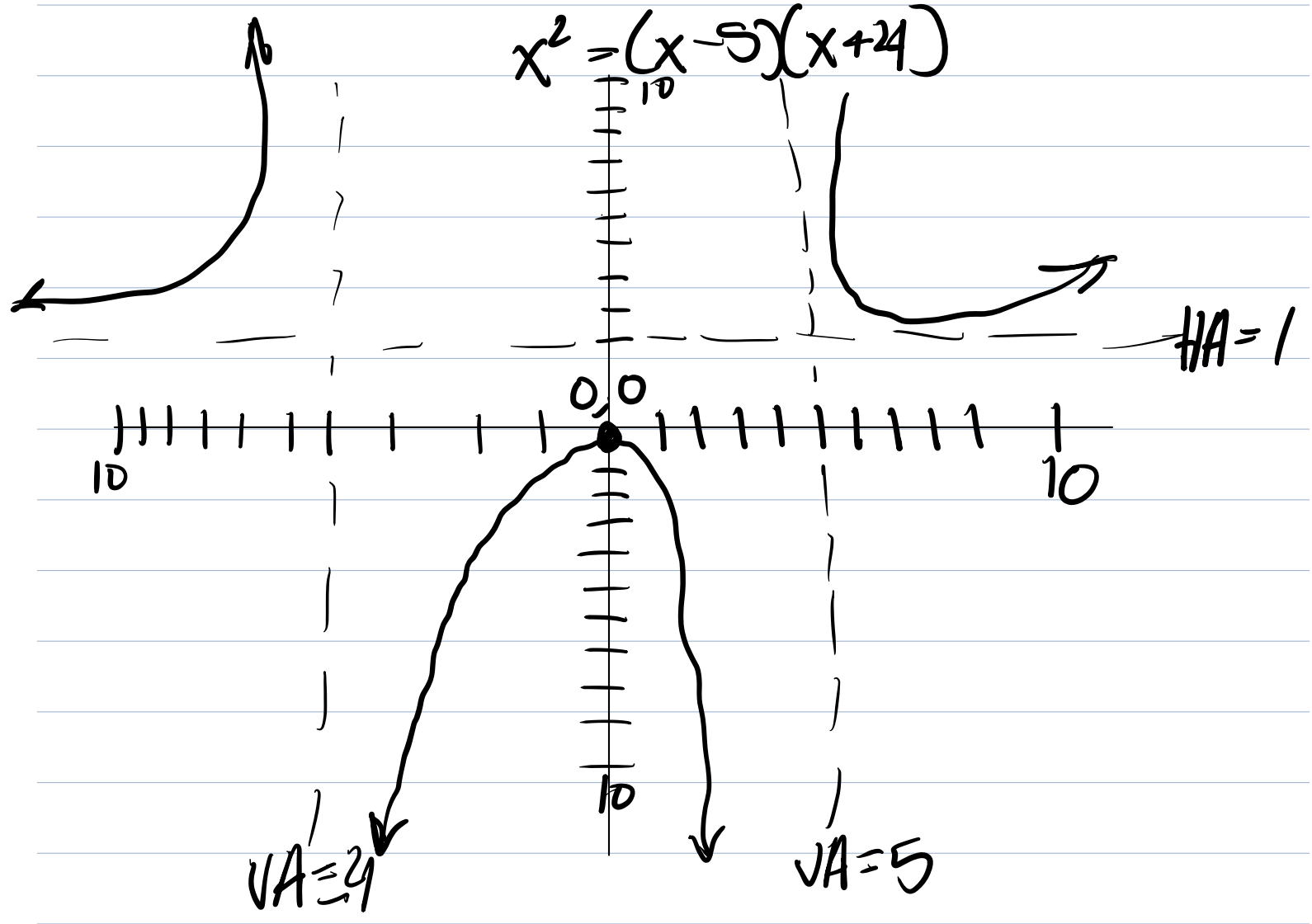
$\frac{x^2}{(x-5)(x+4)}$

y-int = 0, 0

x-int = 0, 0

$x^2 \times 0 = \frac{x^2 \times x^2}{(x-5)(x+4)}$

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



16. $x^4 + 3x^3 - 11x^2 - 3x + 10$

q p

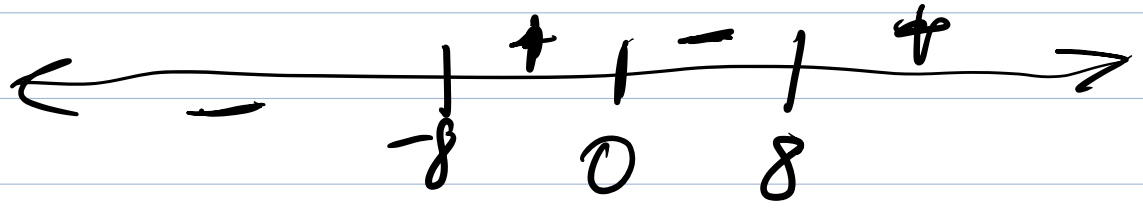
p: 10

q: 1, 2, 5, 10

17. degrees

18. $\frac{(x-8)(x+8)}{x} \leq 0$

$x=8 \quad x-8$



1 $f(-9) = -$
2 $f(-7) = +$
3 $f(7) = -$
4 $f(9) = +$

$[-8, 0] \cup [0, 8)$

19. $f(x) = x^3$

$f^{-1}(x) = \sqrt[3]{x}$

$6-x \quad 6+x = x^2 - 12x + 36$

20. $f(x) = 4x^2 + x + 9 \quad g(x) = 6 - x$

$f \cdot g(x) = 4(6-x)^2 + (6-x) + 9$

$4(x^2 - 12x + 36)$

$4x^2 - 48x + 144 + 6 - x + 9$

$4x^2 - 49x + 159$

21. $f(x) = 6^{x-2}$ right 2

$(-\infty, \infty)$

$(0, \infty)$

22. $\log_2\left(\frac{1}{32}\right) = -5$

23. $f(x) = \log_5(x+3)$

Domain $= (-3, \infty)$

24. $2\ln x + 3\ln y - 5\ln z = \ln\left(\frac{x^2 y^3}{z^5}\right)$

25. $\log_{1/5} 6$

$= -1.1132$

26. $8^{-x+4} = 256^{x}$