

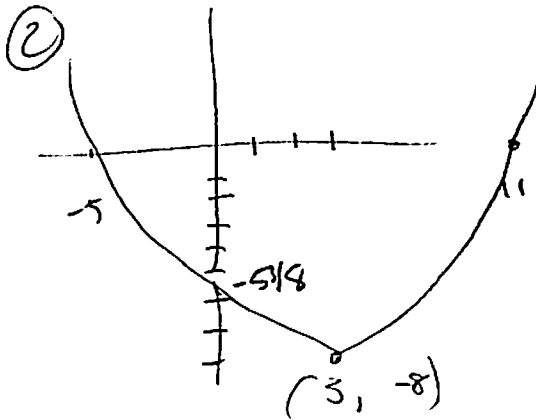
1-5 NO CALCULATOR

6-8 Calculator

For the following list: Domain, Range, x-intercepts, y-intercept, interval increasing, interval decreasing, maximums, minimums, end behavior, concavity (estimate), boundedness, one to one?, function?, continuous?

1. $y = -3x + 5$ 2. $y = 2\left(\frac{1}{4}(x-3)\right)^2 - 8$ 3. $y = x^3$ 4. $y = x^4$ 5. $y = -x^5 - 3$
 6. $y = x^4 - 3x^2$ 7. $y = -x^4 + 5x^2 - 3x + 9$ 8. $y = x^3 - 4x^2 - 3x + 1$

① $0 = -3x + 5$
 $-5 = -3x$
 $\frac{5}{3} = x$



$$4 = \left(\frac{1}{4}(x-3)\right)^2$$

$$2 = \frac{1}{4}(x-3)$$

$$-2 = \frac{1}{4}(x-3)$$

$$8 = x-3$$

~~11 = x~~

11 = x

$$-8 = x-3$$

$$-5 = x$$

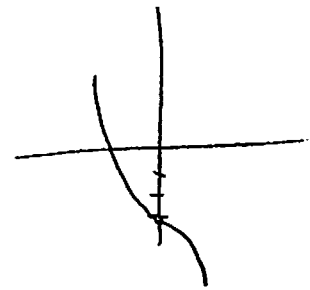
$$y = 2\left(\frac{1}{4}(-3)\right)^2 - 8$$

$$2\left(\frac{9}{16}\right) - 8$$

$$\frac{9}{8} - \frac{64}{8} = -\frac{55}{8}$$

$$\frac{5 \cdot 64}{53}$$

⑤ $y = -x^5 - 3$



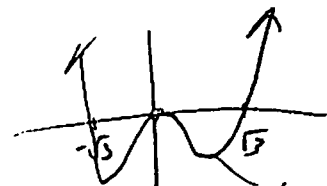
$$0 = -x^5 - 3$$

$$3 = -x^5$$

$$-3 = x^5$$

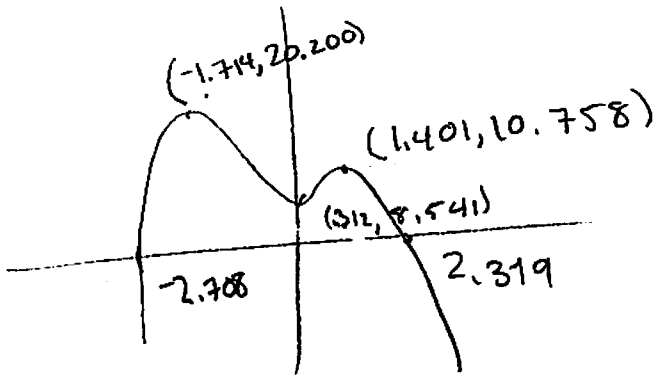
$$\sqrt[5]{-3} = x$$

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

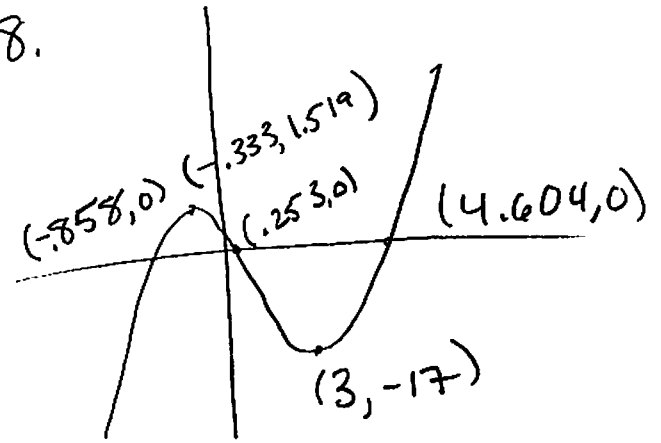


$(-1.225, -2.225)$ $(1.225, -2.225)$

7.

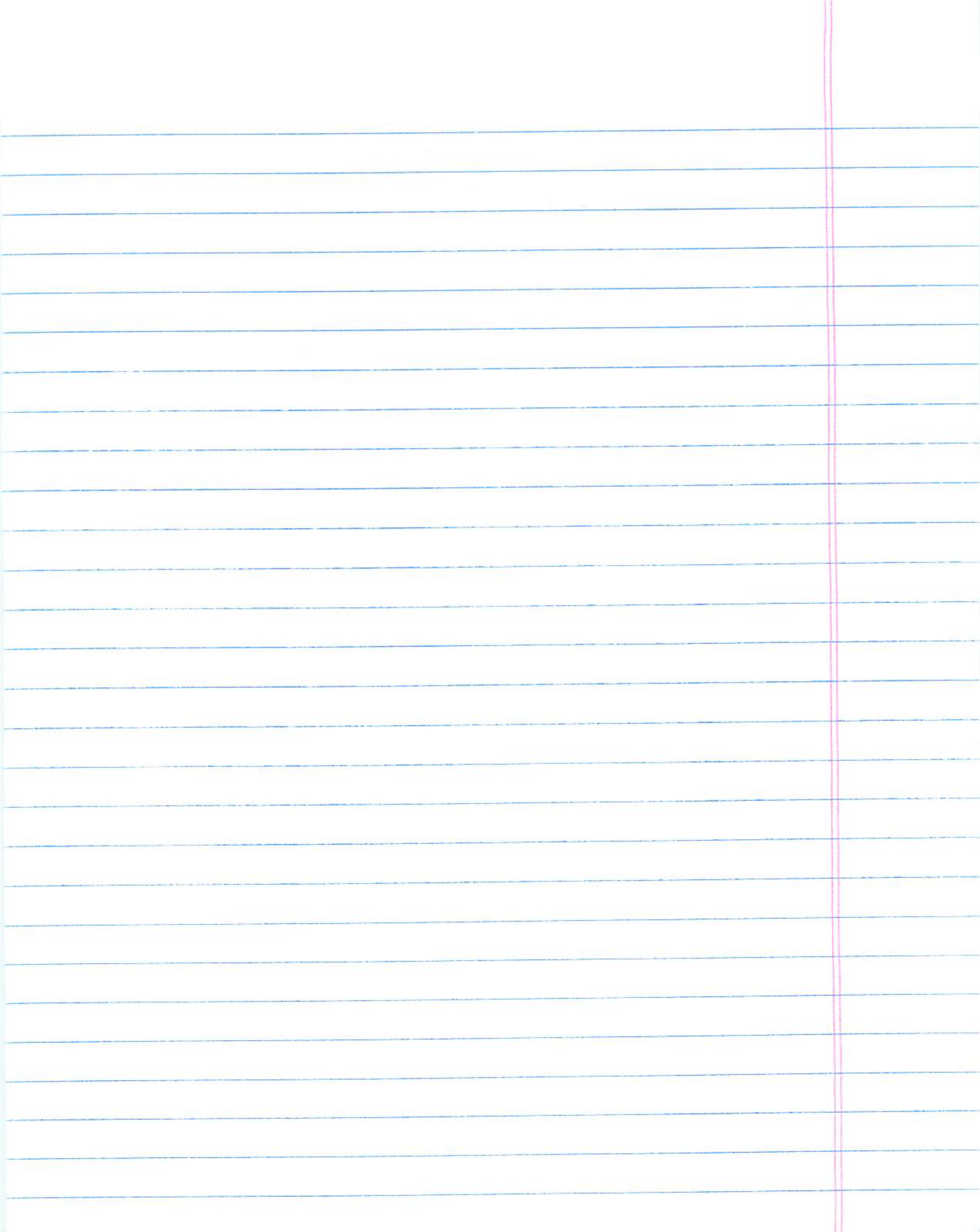


8.



Polynomial Function language

| | 1. $y = -3x + 5$ | 2. $y = 2\left(\frac{1}{4}(x-3)\right)^2 - 8$ | 3. $y = x^3$ | 4. $y = x^4$ | 5. $y = -x^5 - 3$ |
|--------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Domain | \mathbb{R} | \mathbb{R} | \mathbb{R} | \mathbb{R} | \mathbb{R} |
| Range | \mathbb{R} | $[-8, \infty)$ | \mathbb{R} | $[0, \infty)$ | \mathbb{R} |
| x-int | $(5/3, 0)$ | $(-5, 0) (11, 0)$ | $(0, 0)$ | $(0, 0)$ | $(\sqrt[5]{-3}, 0)$ |
| y-int | $(0, 5)$ | $(0, -53/8)$ | $(0, 0)$ | $(0, 0)$ | $(0, -3)$ |
| int inc | \emptyset | $(3, \infty)$ | \mathbb{R} | $(0, \infty)$ | \emptyset |
| int dec | \mathbb{R} | $(-\infty, 3)$ | \emptyset | $(-\infty, 0)$ | $(-\infty, \infty)$ |
| max | \emptyset | None | None | None | None |
| Min | \emptyset | Local + Abs of -8 @ $x=3$ | None | Local + Abs of 0 @ $x=0$ | None |
| end behavior | $x \rightarrow \infty y \rightarrow -\infty$ $x \rightarrow -\infty y \rightarrow \infty$ | $x \rightarrow \infty y \rightarrow \infty$ $x \rightarrow -\infty y \rightarrow \infty$ | $x \rightarrow \infty y \rightarrow \infty$ $x \rightarrow -\infty y \rightarrow -\infty$ | $x \rightarrow \infty y \rightarrow \infty$ $x \rightarrow -\infty y \rightarrow \infty$ | $x \rightarrow \infty y \rightarrow -\infty$ $x \rightarrow -\infty y \rightarrow \infty$ |
| Concavity | None | UP $(-\infty, \infty)$ | Down $(-\infty, 0)$ Up $(0, \infty)$ | up $(-\infty, \infty)$ | up $(-\infty, 0)$ down $(0, \infty)$ |
| boundedness | None | Below | None | below | None |
| one-to-one | yes | No | yes | No | yes |
| function | yes | yes | yes | yes | yes |
| Continuous | yes | yes | yes | yes | yes |



| | | |
|--------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| | 6. $y = x^4 - 3x^2$ | 7. $y = -x^4 + 5x^2 - 3x + 9$ |
| Domain | \mathbb{R} | \mathbb{R} |
| Range | $[-2.25, \infty)$ | $(-\infty, 20.200]$ |
| x-int | $(-\sqrt{3}, 0) (0, 0) (\sqrt{3}, 0)$ | $(-2.7089) (2.319, 0)$ |
| y-int | $(0, 0)$ | $(0, 9)$ |
| int inc | $(-1.225, 0) \cup (1.225, \infty)$ | $(-\infty, -1.714) \cup (.312, 1.401)$ |
| int dec | $(-\infty, -1.225) \cup (0, 1.225)$ | $(-1.714, .312) \cup (1.401, \infty)$ |
| Max | Local of 0 @ $x=0$ | Local + Abs of 20.200 @ $x = -1.714$ Local of 10.758 @ $x = 1.401$ |
| Min | Local + Abs of -2.25 @ $x = -1.225, 1.225$ | Local min of 8.541 @ $x = .312$ |
| end behavior | $x \rightarrow \infty y \rightarrow \infty$ $x \rightarrow -\infty y \rightarrow \infty$ | $x \rightarrow \infty y \rightarrow -\infty$ $x \rightarrow -\infty y \rightarrow -\infty$ |
| Concavity | UP $(-\infty, -1) \cup (1, \infty)$ Down $(-1, 1)$ | Down $(-\infty, -1) (.2, \infty)$ UP $(-1, .2)$ |
| bandedness | Below | Above |
| one-to-one | No | No |
| Function | Yes | yes |
| continuous | yes | yes |

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$$f(x) = x^3 - 4x^2 - 3x + 1$$

| | |
|--------------|----------------------------------------------------------------------------------------------------------|
| Domain | \mathbb{R} |
| Range | \mathbb{R} |
| x-int | $(-0.858, 0) (4.604, 0)$ |
| y-int | $(0, 1)$ |
| int inc | $(-\infty, -0.333) \cup (3, \infty)$ |
| int dec | $(-0.333, 3)$ |
| max | Local of 1.519 @ $x = -0.333$ |
| Min | Local of -17 @ $x = 3$ |
| End behavior | $x \rightarrow \infty \quad y \rightarrow \infty$ $x \rightarrow -\infty \quad y \rightarrow -\infty$ |
| Concavity | Down $(-\infty, 1)$ UP $(1, \infty)$ |
| boundedness | None |
| one-to-one | No |
| function | Yes |
| continuous | Yes |

