16.) Use the graph to answer A-H below. Round answers to the nearest tenth.

A. y-intercept: $(0, -4)$

B. zero(s): $x = -1$ $x = 2$ $x = 4$

C. Relative Minimum: $(.2, -4.1)$

Relative Maximum: $(3.1, 2)$

Absolute Minimum: N/A

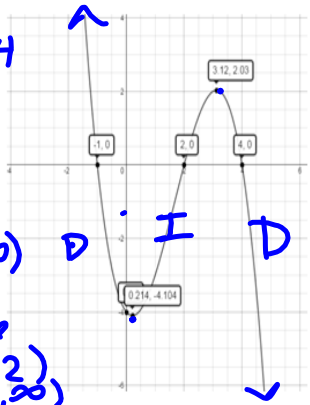
Absolute Maximum: N/A

D. Domain: $\mathbb{R}$ $(-\infty, \infty)$

E. Range: $(-\infty, \infty)$

F. Intervals of increase or decrease: x value

I $(.2, 3.12)$ D: $(-\infty, .2)$ $(3.12, \infty)$



G. End behavior as $x \to -\infty, f(x) \to \infty$
as $x \to +\infty, f(x) \to -\infty$

Critical points on the graph (hard to read):
$(-1,0), (2,0), (4,0), (0,-4), (0.2,-4.1), (3.1,2.0)$

H. Is the function odd, even or neither? Neither Explain.

Odd – origin
Even – y axis

17.) What type of symmetry does an even function have? y-axis

an odd function? origin

18.) Give the end behavior of (each) of the following functions.

A) $f(x) = x^6 - 7x^3 = 14x + 41$ as $x \to \infty$, $f(x) \to \infty$; as $x \to -\infty$, $f(x) \to \infty$

↑ ↑ E +

B) $g(x) = -2x^4 + x^2 + 71$ as $x \to \infty$, $f(x) \to -\infty$; as $x \to -\infty$, $f(x) \to -\infty$

↓ ↓ E −

C) $h(x) = x^3 + 5x^2 - 7x + 71$ as $x \to \infty$, $f(x) \to \infty$; as $x \to -\infty$, $f(x) \to -\infty$

↓ ↑ O +

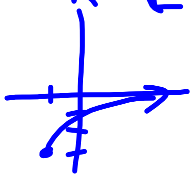
D) $j(x) = -12x^3 + x^2 + 7x - 71$ as $x \to \infty$, $f(x) \to -\infty$; as $x \to -\infty$, $f(x) \to \infty$

↑ ↓ O −

UNIT 4

19.) Graph the function $f(x) = \sqrt{x+1} - 3$; state the domain and range.

19 D: $[-1, \infty)$
R: $[-3, \infty)$



20-22: Simplify each expression using properties of rational exponents.

20.) $3x^{\frac{2}{3}} \cdot 6x^{\frac{4}{3}} \cdot 2x^5$

$36x^7$

mult. add exp

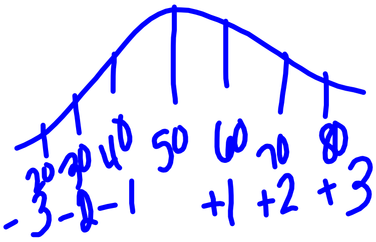
21.) $\dfrac{x^{\frac{7}{5}}}{x^{\frac{4}{5}}}$ divide sub. exp

$x^{\frac{3}{5}} = \sqrt[5]{x^3}$

22.) $\left(16x^{-4}y^{20}\right)^{\frac{1}{4}}$

$16^{\frac{1}{4}} x^{-1} y^5 = \dfrac{2y^5}{x}$

z-score - normalize a point not on a curve.
- standard deviation.



Example 3 *Use a z-score and the standard normal table*

Height A survey of a group of women found that the height of the women is normally distributed with a mean height of 64.5 inches and a standard deviation of 2.5 inches. Find the probability that a randomly selected woman is at most 58 inches tall.

Solution

1. Find the z-score corresponding to an x-value of 58.

$\boxed{z = \frac{x - \bar{x}}{\sigma}} = \frac{58-64.5}{2.5} = -2.60$

2. Use the standard normal table to find $P(x \le 58) = P(z \le -2.60)$. The table shows that $P(z \le -2.60) = .0047$. So, the probability that a randomly selected woman is at most 58 inches tall is .0047.

z	.0	.1	.2	.3	.4
−2	.0228	.0179	.0139	.0107	.0082
2	.9772	.9821	.9861	.9893	.9918

z	.5	.6	.7	.8	.9
−2	.0062	.0047	.0035	.0026	.0019
2	.9938	.9953	.9965	.9974	.9981

$$Z = \frac{X - \text{mean}}{\text{St. deviation}}$$

* Z-scores only work ≤

* ≥ you have to 1 − #

Checkpoint Complete the following exercises.

2. In Example 2, about what percent of the test-takers have scores between 403 and 633?

68%

3. In Example 3, find the probability that a randomly selected woman is at most 70 inches tall.

$\frac{(70-64.5)}{2.5} = 2.20$

$P(z \leq 2.20) = .9861$

Prob atleast 72 in tall

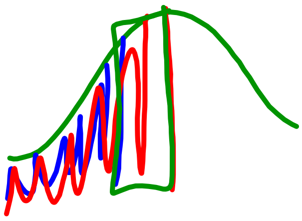
$\geq \quad \frac{72-64.5}{2.5} = 3.00 \quad P = .9987$

$1 - .9987 = .0013$

Prob between 61in and 65in

1. Find both z-scores

$*\frac{61-64.5}{2.5} = -1.40$ $*\frac{65-64.5}{2.5} = 0.20$



2. Find Prob.

.0808 .5793

3. Subtract Prob .5793 - .0808

.4985