

Ch. 7 Jeopardy

Radical Form	Power and Composite Functions	Solving Radical Equations
10	10	10
20	20	20
30	30	30
40	40	40
50	50	50

Rational, Root, Step: 10 pts

Find the domain, range, and vertical and horizontal asymptotes.

$$f(x) = \frac{-8}{x-2}$$

$D: x > 2, x \neq 2$ (or $x \neq 2$)
 $R: y > 0, y < 0$ (or $y \neq 0$)
 HA: $y = 0$
 VA: $x = 2$
 Direct
 $y = 2x$
 $D: (-\infty, 2) \cup (2, \infty)$
 $R: (-\infty, 0) \cup (0, \infty)$

Rational, Root, Step: 20 pts

Find the domain, range, and Tell how it was changed from the parent graph.

$$f(x) = \sqrt{x+4} + 2$$

$D: [4, \infty)$
 $R: [2, \infty)$

Rational, Root, Step: 30 pts

Find the domain, range, and Tell how it was changed from the parent graph.

$$f(x) = -\sqrt{x-5} - 4$$

$D: \mathbb{R}$
 $R: \mathbb{R}$
 Right 5 down 4 reflect across x-axis
 $D: (-\infty, \infty)$
 $R: (-\infty, \infty)$
 $(5, 3)$
 $(x_2, 12)$
 $15 = 12x$
 $x = \frac{5}{4}$
 1.25
 1.3
 1.65

Rational, Root, Step: 40 pts

Find the domain, range, and Tell how it was changed from the parent graph.

$$f(x) = 3[x+2] - 1$$

$D: \mathbb{R}$ (all real #s)
 $R: \text{integer multiples of } 3$
 Vertical stretch by 3, translated left + 2 down 1

Rational, Root, Step: 50 pts

Put the function in a form easier to graph. Then, find the domain, range, and Tell how it was changed from the parent graph.

$$f(x) = -\sqrt{25x-100} + 6$$

$-\sqrt{25(x-4)} + 6$
 $y = -5\sqrt{(x-4)} + 6$

Power Functions: 5 pts

Scientists have concluded that the pulse rate of mammals is a power function of their body weight. Find the power function to model the following data. Then use the model to predict the pulse rate for a 450 kg horse.

Mammal	Body Weight (kg)	Pulse Rate (beats/min)
Rat	0.2	430
Guinea Pig	0.3	300
Rabbit	2	295
Small Dog	5	120
Large Dog	30	85
Sheep	50	70
Human	70	72

Power Reg in Calc
 \Rightarrow do Power Reg $L1, L2, Y1, Y2$
 $y = 231.20 \cdot x^{-0.2969}$
 $x = 450$
 $y = 231.20 \cdot (450)^{-0.2969}$
 or $y(450)$ on main screen
 or $x = 450$ in table
 37.7 beats/min

Power Functions: 10 pts

Is the following a direct or inverse variation? Write the equation for the variation.

X	Y
2	4
4	8
10	20
12.5	25

Power Functions: 20 pts

Does the data show direct or inverse variation? Use this information to find the missing value.

x	0.5	-0.5	20	-1
y	10	-10	?	-5

Inverse
 $y = \frac{5}{x}$
 $x = \frac{1}{4}$

Power Functions: 40 pts

Find x when y = 5, if y varies inversely as x and x = 6 when y = -18

$6(-18) = x \cdot 5$
 $x = -21.6$

Power Functions: 10 pts

Evaluate $f(-3)$, $f(0)$, and $f(5)$:

$$f(x) = \begin{cases} -\sqrt{x+4} + 2, & x > -3 \\ 5, & x \leq -3 \end{cases}$$

$f(-3) = 5$
 $f(0) = 0$
 $f(5) = -1$

$$\frac{x}{x-5} = \frac{x}{(x-5)(x+5)}$$

$$(x-5)(x+5) = x(x-5)$$

$$x^2 - 25 = x^2 - 5x$$

Solving for x: $x = 5$

Solve:

$$\frac{x}{x-5} = \frac{x}{x^2-25}$$

Review: 10pts

Solve the equation. Check for any extraneous solutions.

$$\sqrt{x} = -5$$

Review 3pts

Solve the equation. Check for any extraneous solutions.

$$\frac{x}{x^3+7} = 88$$

$$x^{4/3} = 81$$

$$x = 27$$

Solving Rational Step 30

Solve:

$$2[3x-2] = 14$$

$$7 \leq 3x + 2 < 8$$

$$5 \leq 3x < 6$$

$$\frac{5}{3} \leq x < 2$$

Solve:

$$\frac{7x+3}{x^2-8x+15} + \frac{3x-1}{x-5} = \frac{-1}{x-3}$$

$$7x+3 + 3x(x-3) = -1(x-5)$$

$$7x+3 + 3x^2 - 9x = -x+5$$

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

Solve the equation. Check for any extraneous solutions.

$$\sqrt{x+4} = \sqrt[3]{3x-10}$$

$$x+4 = 3x-10$$

$$14 = 2x$$

$$x = 7$$

D: $(-\infty, 6]$
R: $[0, \infty)$

PCCWS + Int 30

Identify the domain and range of the piecewise function shown

PCCWS + Int 50

Evaluate $f(x+3) - f(x)$ given:

$$f(x) = x^2 + 2$$

$$f(x+3) = (x+3)^2 + 2 = x^2 + 6x + 9 + 2 = x^2 + 6x + 11$$

$$f(x+3) - f(x) = x^2 + 6x + 11 - (x^2 + 2) = 6x + 9$$

Solve

$$\frac{k}{k+1} + \frac{k}{k-2} = 2$$

$$k(k-2) + k(k+1) = 2(k+1)(k-2)$$

$$k^2 - 2k + k^2 + k = 2(k^2 - k - 2)$$

$$2k^2 - k = 2k^2 - 2k - 4$$

$$k = -4$$

PCCWS + Int 20

Evaluate $g(1.5)$, $g(-2.7)$ and $g(0)$ for

$$g(x) = [x]$$

$$g(1.5) = 1, g(-2.7) = -3, g(0) = 0$$

Write a piecewise function for the graph shown

$$y = \begin{cases} x^2 & x < 2 \\ 6 & x = 2 \\ 10-x & 2 < x \leq 6 \end{cases}$$

Solve

$$[4x-1] = 5$$

$$5 \leq 4x-1 < 6$$

$$6 \leq 4x \leq 7$$

$$\frac{6}{4} \leq x < \frac{7}{4}$$

$$\left[\frac{3}{2}, \frac{7}{4}\right)$$

Review: 40 pts

Solve the equation. Check for any extraneous solutions.

$$\sqrt{2x} - \sqrt{x^2 - 24} = 0$$

$$2x = x^2 - 24$$

$$x^2 - 2x - 24 = 0$$

$$(x+6)(x-4)$$

$$(x-4)(x+4)$$

$$x = 4$$

$$\sqrt{2 \cdot 6} - \sqrt{6^2 - 24} = 0$$

$$\sqrt{12} - \sqrt{12} = 0$$

$$\sqrt{2 \cdot 4} - \sqrt{4^2 - 24} = 0$$

$$\sqrt{8} - \sqrt{-8} = 0$$

Not real because $\sqrt{-8}$ gives imaginary solution

$x = -4$ is extraneous solution

Review: 50 pts

Solve the equation. Check for any extraneous solutions.

$$(x+5)^6 + 3 = 0$$

No solution

$$(x+5)^6 = -3$$

$$(x+5)^6 = (-3)^6$$

$$x+5 = 729$$

$$x = 724$$

$$(724+5)^6 + 3 = 0$$

$$3 + 3 \neq 0$$

$x = 724$ is extraneous solution

