

Unit 2: Quiz Part A: REVIEW Radicals – no Calculator!

1. Simplify the following:

a) $\sqrt{50}$ b) $\sqrt{7} - 3\sqrt{7}$ c) $5\sqrt{3} - 4\sqrt{72} + \sqrt{150} + 2\sqrt{8}$

d) $5\sqrt{3}(4 + 5\sqrt{3} - 2\sqrt{15})$ e) $(\sqrt{2} + 5)(2 - \sqrt{2})$ f) $\frac{4 \pm \sqrt{28}}{2}$

Unit 2: Quiz Part B: REVIEW Quadratics -- Calculator Allowed!

1. Determine the maximum or minimum value of the function $q(x) = -2x^2 - 3x + 5$ and state the x – value for which this occurs, USING ALL THREE METHODS (Factoring, Partial Factoring, Completing the Square). State the domain and range of the Parabola.

2. Given $p(x) = 3x - 7$ a) Calculate the value of $p(2)$. b) If $p(x) = -9$, calculate the value of x .

3. For each of the following, determine whether the relation is a function or not. Be prepared to justify your answer.

a) $x^2 + y^2 = 9$ b) $x = -3$ c) $y = 0$ d) $3x^2 - 6y = 9$ e) $3x - 5y = 14$

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Radicals Quiz Review

Solutions.

PART A

$$\begin{aligned} 1. a) \sqrt{50} \\ &= \sqrt{25 \times 2} \\ &= \sqrt{25} \times \sqrt{2} \\ &= 5\sqrt{2} \end{aligned}$$

$$\begin{aligned} b) \sqrt{7} - 3\sqrt{7} \\ &= -2\sqrt{7} \end{aligned}$$

$$\begin{aligned} c) 5\sqrt{3} - 4\sqrt{72} + \sqrt{150} + 2\sqrt{8} \\ &= 5\sqrt{3} - 4\sqrt{36 \times 2} + \sqrt{25 \times 6} + 2\sqrt{4 \times 2} \\ &= 5\sqrt{3} - 4(6)\sqrt{2} + 5\sqrt{6} + 2(2)\sqrt{2} \\ &= 5\sqrt{3} - 24\sqrt{2} + 5\sqrt{6} + 4\sqrt{2} \\ &= 5\sqrt{3} + 5\sqrt{6} - 20\sqrt{2} \end{aligned}$$

$$\begin{aligned} d) 5\sqrt{3}(4 + 5\sqrt{3} - 2\sqrt{15}) \\ &= 20\sqrt{3} + 25(3) - 10\sqrt{3}\sqrt{3}\sqrt{5} \\ &= 20\sqrt{3} + 75 - 10(3)\sqrt{5} \\ &= 20\sqrt{3} + 75 - 30\sqrt{5} \end{aligned}$$

$$\begin{aligned} e) (\sqrt{2} + 5)(2 - \sqrt{2}) \\ &= 2\sqrt{2} - 2 + 10 - 5\sqrt{2} \\ &= 8 - 3\sqrt{2} \end{aligned}$$

$$\begin{aligned} f) \frac{4 \pm \sqrt{28}}{2} \\ &= \frac{4 \pm \sqrt{4 \times 7}}{2} \\ &= \frac{4 \pm 2\sqrt{7}}{2} \end{aligned}$$

$\rightarrow = \frac{2(2 \pm \sqrt{7})}{2}$
 $= 2 \pm \sqrt{7}$

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PART B Simplify.

$$\begin{aligned}
 \text{a) } \sqrt{48} &= \sqrt{16 \times 3} \\
 &= 4\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } 2\sqrt{15} \times 10\sqrt{21} &= 20\sqrt{15 \times 21} \\
 &= 20\sqrt{315} \\
 &= 20\sqrt{3 \times 3 \times 5 \times 7} \\
 &= 20(\sqrt{9})(\sqrt{35}) \\
 &= 20(3\sqrt{35}) \\
 &= 60\sqrt{35}
 \end{aligned}$$

extra questions.

$$1. q(x) = -2x^2 - 3x + 5$$

a) factoring

$$\begin{aligned}
 q(x) &= -(2x^2 + 3x - 5) \\
 &= -(2x+5)(x-1)
 \end{aligned}$$

$$\begin{aligned}
 \text{zeros } 2x+5=0 & \quad x-1=0 \\
 x = \frac{-5}{2} & \quad x=1
 \end{aligned}$$

$$\text{A of S: } x = \left(\frac{-5}{2} + 1\right) \div 2$$

$$x = \left(\frac{-5+2}{2}\right) \times \frac{1}{2}$$

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

$$q\left(\frac{-3}{4}\right) = -\left[2\left(\frac{-3}{4}\right) + 5\right]\left[\frac{-3}{4} - 1\right]$$

$$= -\left[\frac{-3}{2} + \frac{10}{2}\right]\left[\frac{-7}{4}\right]$$

$$= -\left(\frac{7}{2}\right)\left(\frac{-7}{4}\right)$$

$$= \frac{49}{8}$$

∴

∴ Max value of $\frac{49}{8}$
when $x = \frac{-3}{4}$.

b) partial factoring

$$q(x) = -2x\left(x + \frac{3}{2}\right) + 5$$

$$\text{A of S: } x = \frac{-3}{2} \div 2$$

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

$$q\left(\frac{-3}{4}\right) = -2\left(\frac{-3}{4}\right)\left(\frac{-3}{4} + \frac{6}{4}\right) + 5$$

$$= \frac{3}{2}\left(\frac{3}{4}\right) + 5$$

$$= \frac{9}{8} + \frac{40}{8}$$

$$= \frac{49}{8}$$

c) completing the square

$$q(x) = -2\left(x^2 + \frac{3}{2}x + \frac{9}{16} - \frac{9}{16}\right) + 5$$

$$q(x) = -2\left(x + \frac{3}{4}\right)^2 + \frac{9}{8} + \frac{40}{8}$$

$$q(x) = -2\left(x + \frac{3}{4}\right)^2 + \frac{49}{8}$$

$$D: \{x \in \mathbb{R}\} \quad R: \left\{y \leq \frac{49}{8}\right\}$$

Quest Review


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2. $p(x) = 3x - 7$

a) $p(2) = 3(2) - 7$
 $= 6 - 7$
 $= -1$
 $\therefore p(2) = -1$

b) $p(x) = -9$
 $-9 = 3x - 7$
 $-9 + 7 = 3x$
 $3x = -2$
 $x = -\frac{2}{3}$

$\therefore p\left(-\frac{2}{3}\right) = -9$

3. EQUATION	TYPE OF GRAPH	FUNCTION?	DOMAIN	RANGE
a) $x^2 + y^2 = 9$	circle	no	$\{-3 \leq x \leq 3\}$	$\{-3 \leq y \leq 3\}$
b) $x = -3$	line	no (vertical line)	$\{-3\}$	$\{y \in \mathbb{R}\}$
c) $y = 0$	line	yes (horizontal line)	$\{x \in \mathbb{R}\}$	$\{0\}$
d) $3x^2 - 6 = y$ $y = 3x^2 - 6$	parabola 	yes	$\{x \in \mathbb{R}\}$	$\{y \geq -6\}$
e) $3x - 5y = 14$	line	yes (sloped line)	$\{x \in \mathbb{R}\}$	$\{y \in \mathbb{R}\}$

↓
explanation
for ↗

only parabola
Domain, Range
required for
this unit.

f) $\{(0, 1), (1, 2), (1, 3)\}$

No.
(two points
are lined up
vertically).

$\{0, 1\}$ $\{1, 2, 3\}$