Quiz Solutions

These are suggested solutions. Other solutions may be possible.

Quiz 1

1. Write $\{x| -4 < x < 4\}$ in interval notation, and graph the interval on a number line. (R.1, 12)

Answer:

Interval notation: $(-4, 4)$.

[Graph of number line showing interval: can't do this easily on computer.]

2. Factor $3y^2 + 7y - 20$. (R.4, 32)

Answer:

We look for factors of $3 \times (-20) = -60$ *that add to give* 7.

Factors	Sum
-1, 60	-59
-2, 30	28
-3, 20	17
-4, 15	11
-5, 12	7
-6, 10	4

So 12 *and* -5 *are the factors we want. Factoring by grouping:*

$$\begin{aligned} 3y^2 + 7y - 20 &= 3y^2 + 12y - 5y - 20 \\ &= 3y(y+4) - 5(y+4) \\ &= (y+4)(3y-5). \end{aligned}$$

Quiz 2

1. Simplify

$$\frac{a - \frac{a}{b}}{b - \frac{b}{a}}.$$

(R.5, 52)

Answer:

$$\begin{aligned} \frac{a - \frac{a}{b}}{b - \frac{b}{a}} &= \frac{\frac{ab}{b} - \frac{a}{b}}{\frac{ab}{a} - \frac{b}{a}} \\ &= \frac{\frac{ab-a}{b}}{\frac{ab-b}{a}} \\ &= \frac{ab - a}{b} \frac{a}{ab - b} \\ &= \frac{a^2(b-1)}{b^2(a-1)} \end{aligned}$$

2. Simplify, and then if appropriate write in radical notation

$$\frac{a^{1/2}b^{5/8}}{a^{1/4}b^{3/8}}.$$

(R.6, 112)

Answer:

$$\begin{aligned}\frac{a^{1/2}b^{5/8}}{a^{1/4}b^{3/8}} &= a^{1/2}b^{5/8}a^{-1/4}b^{-3/8}\\ &= a^{\frac{1}{2}-\frac{1}{4}}b^{\frac{5}{8}-\frac{3}{8}}\\ &= a^{1/4}b^{1/4}\\ &= (ab)^{1/4}\\ &= \sqrt[4]{ab}.\end{aligned}$$