Name:
BAM Indicator: Simplify surds, including rationalising the denominator of a surd expression

1. Lily writes

$$
\sqrt{ } 48=\sqrt{ } 16 \times 3=4 \times 3=12
$$

Lily is incorrect.
Explain what Lily has done wrong. Correct her answer.
2. a) Simplify fully:
i. $\sqrt{50}$
ii. $\sqrt{108}$
iii. $\sqrt{\frac{36}{64}}$
iv. $\sqrt{\frac{7}{25}}$
b) Rationalise the denominator of these surds. Write the answers in their simplest form.
i. $\frac{12}{2 \sqrt{3}}$
ii. $\frac{12}{5-\sqrt{3}}$
iii. $\frac{12+\sqrt{2}}{5-\sqrt{3}}$
3. Find the values of $p, q$ and $r$ that make this statement true:

$$
(p+\sqrt{5})(6-\sqrt{q})=13+r \sqrt{5}
$$

$$
p=
$$

$\qquad$
$q=$ $\qquad$

$$
r=
$$

$\qquad$
4. Find the exact value of $x$.

Give your answer in its simplest form.

5. State whether the following statements are always true, sometimes true or never true. Justify your answer in each case.
a) $\sqrt{a+b}=\sqrt{a}+\sqrt{b}$
b) $\sqrt{a \times b}=\sqrt{a} \times \sqrt{b}$
c) $\sqrt{a^{2}+b^{2}}=a+b$
d) $(a-\sqrt{b})^{2}=a^{2}-b$

| Overall, I think my success level is: | Low |
| :--- | :--- |

$F=$ Fluency $\quad R=$ Reasoning $\quad P=$ Problem-solving $\quad A=$ Application $\quad M=$ Misconception

| Q | SURDS | $\odot{ }^{\circ}$ | 0 |
| :--- | :--- | :---: | :---: |
|  | I can simplify a surd |  |  |
|  | I can rationalise the denominator of a fraction when it is of the form $a \sqrt{b}$ |  |  |
|  | I can rationalise the denominator of a fraction when it is of the form $a \pm \sqrt{b}$ |  |  |
| Improvements I could make: |  |  |  |
| Mathematical presentation | Method | Accuracy | Units |

