

Math 31

Factoring and Radicals.

Name Key
Date _____

1. Factor completely.

a) $x^2 - 3x - 40 = (x-8)(x+5)$

$$\begin{array}{l} \text{mult} = -40x^2 \\ \text{add} = -3x \\ \hline -8x, 5x \end{array}$$

b) $4x^2 - 15x + 14 = (4x-7)(x-2)$

$$\begin{array}{l} \text{mult} = 56x^2 \\ \text{add} = -15x \\ \hline -8x, -7x \end{array}$$

[8]

$$\begin{aligned} \text{c) } 2x^4 + 16x &= 2x(x^3 + 8) \\ &= 2x(x+2)(x^2 - 2x + 4) \end{aligned}$$

$$\begin{aligned} \text{d) } 3(x^2+4)^{3/2} - 5(x^2+4)^{1/2} &= (x^2+4)^{-1/2} [3(x^2+4) - 5] \\ &= \frac{3x^2 + 7}{(x^2+4)^{1/2}} \end{aligned}$$

2. Rationalize

$$\begin{aligned} \text{a) } \frac{\sqrt{x+4}-2}{x} \left(\frac{\sqrt{x+4}+2}{\sqrt{x+4}+2} \right) &= \frac{(x+4)-4}{x(\sqrt{x+4}+2)} = \frac{x}{x(\sqrt{x+4}+2)} \\ &= \frac{1}{\sqrt{x+4}+2} \end{aligned}$$

[4]

$$\begin{aligned} \text{b) } \frac{x-1}{\frac{1}{\sqrt{x}}-1} \left(\frac{\sqrt{x}}{\sqrt{x}} \right) &= \frac{(x-1)(\sqrt{x})}{1-\sqrt{x}} \left(\frac{1+\sqrt{x}}{1+\sqrt{x}} \right) = \frac{(x-1)(\sqrt{x})(1+\sqrt{x})}{1-x} \\ &= -\sqrt{x}(1+\sqrt{x}) \text{ or } -(\sqrt{x}+x) \end{aligned}$$