

## Exponents and Radicals Module Review

Name: \_\_\_\_\_

1) Evaluate the following exponents/radicals **without** the help of your calculator (using exponent rules): (2 mark each)

a)  $49^{-\frac{1}{2}}$

b)  $\left(\frac{8}{125}\right)^{-\frac{2}{3}}$

c)  $\left(\frac{32}{18}\right)^{\frac{3}{2}}$

d)  $(-8)^{\frac{2}{3}}$

2) Evaluate the following exponents/radicals **with** the help of your calculator: (1 mark each)

a)  $25^{-2}$

b)  $\sqrt[5]{36}$

c)  $7^{\frac{2}{5}}$

d)  $(-5)^{\frac{2}{3}}$

e)  $-5^{\frac{2}{3}}$

d)  $(\sqrt[3]{4})^4$

3) Simplify the following and write as a single radical if possible. (2 marks each)

a)  $7\sqrt{2} - 3\sqrt{2} + \sqrt{3}$

b)  $3\sqrt{x}\sqrt{x-1}$

c)  $2\sqrt{3x} + 4\sqrt{27x} - 2\sqrt{48x}$

d)  $7\sqrt{2}\sqrt{6}$

e)  $-\sqrt[3]{16y} + 4\sqrt[3]{2y} - 3\sqrt[3]{y}$

f)  $5\sqrt{2x^3} - 3x\sqrt{2x}$

g)  $-\sqrt[3]{27x^4} + 4x\sqrt[3]{x} - 3\sqrt[3]{x^5}$

h)  $-2\sqrt{75x^3} + 4x\sqrt{12x} + 5\sqrt{x}\sqrt{27}$

4) Simplify the following (if possible): (2 marks each)

a)  $2x^{\frac{1}{2}} \times (-5x^{\frac{2}{3}})$

b)  $(8x + 7)^{\frac{3}{2}}$

c)  $3x^{-\frac{2}{5}} \times (2 - 4x + 7x^3)$

d)  $\left(\frac{8}{27}x^6\right)^{\frac{2}{3}}$

$$e) (2x^{-\frac{3}{4}} + 4\sqrt[3]{x}) \times (-\sqrt{x^2} + 5x)$$

$$f) \left(\frac{9}{4}x^3\right)^{-\frac{5}{2}}$$

5) Rationalize and Simplify the following radical expressions:

$$a) \sqrt{3}(7\sqrt{2} - 3\sqrt{3})$$

$$b) (3\sqrt{5} - 1)(2\sqrt{5} - 3\sqrt{2})$$

$$c) 2\sqrt{10}(3\sqrt{2} - 4\sqrt{5}) + \sqrt{2}(9 + \sqrt{10})$$

$$d) \frac{3\sqrt{3} - 5\sqrt{2}}{\sqrt{3} + \sqrt{2}}$$

$$e) \frac{5\sqrt{5} + \sqrt{2}}{2\sqrt{5} - 3\sqrt{2}}$$

$$f) \frac{(\sqrt{7} + \sqrt{5})(2\sqrt{5} - 3\sqrt{7})}{\sqrt{5} - 2\sqrt{7}}$$