

Show all your work if you want to receive credit.

(1) Rationalize the denominator

(a)  $\frac{3}{\sqrt{2}}$

(b)  $\frac{4}{6\sqrt{2}}$

(c)  $\frac{3}{\sqrt[3]{3}}$

(d)  $\frac{4}{\sqrt[4]{x^3y^5}}$

(2) Simplify the following. Assume variables are positive real numbers.

(a)  $(3\sqrt{5} - \sqrt{2})(2\sqrt{5} + 3\sqrt{2})$

(b)  $2\sqrt{75x^3} - 4x\sqrt{27x}$

(3) Simplify the following. Write the answers without using negative exponents. Assume variables are positive real numbers

(a)  $\frac{2^{4/3}2^{1/2}}{2^{5/6}}$

(b)  $\frac{(8x^2)^{1/2}(8x^2y^3)^{1/2}}{(4x^3y^2)^{1/2}}$

(4) Solve the following equation for  $t$ .  $r = \sqrt[3]{\frac{GMt^2}{4}}$ (5) Find a decimal value for  $B$ , accurate to two places to the right of the decimal point, if  $m = 0.09$ ,  $M = 0.075$ ,  $g = 32.17$  and  $B = \sqrt{\frac{g}{m^2 + M^2}}$ 

(6) The hypotenuse of a right triangle has length 26. The one of the legs is 14 less than the other leg. What is the length of the shortest side?