NAME: _____ DATE: _____

MPM 2DI – *Radicals*

1. Estimate the value of the following to the nearest *whole number* (that means **no calculators!**):

a) $\sqrt{19}$ b) $\sqrt{75}$ c) $\sqrt{5}$ d) $\sqrt{50}$ e) $\sqrt{130}$

2. Change to *entire* radicals:

a) $2\sqrt{3}$ b) $5\sqrt{2}$ c) $3\sqrt{11}$ d) $10\sqrt{3}$ e) $11\sqrt{2}$

3. Change to *mixed* radicals in simplest form:

a) $\sqrt{12}$ b) $\sqrt{18}$ c) $\sqrt{20}$ d) $\sqrt{32}$ e) $\sqrt{45}$
f) $\sqrt{75}$ g) $\sqrt{108}$ h) $2\sqrt{50}$ i) $3\sqrt{200}$ j) $\sqrt{1024}$

4. Simplify:

a) $5\sqrt{2}-3\sqrt{2}+7\sqrt{11}+2\sqrt{11}$
b) $4\sqrt{5}-2\sqrt{7}+3\sqrt{7}-\sqrt{5}$
c) $5\sqrt{6}+2\sqrt{3}-5\sqrt{6}+2+4\sqrt{3}-7$
d) $\sqrt{12}+\sqrt{27}$
e) $\sqrt{50}-\sqrt{18}$
f) $2\sqrt{8}+\sqrt{18}+4\sqrt{2}$
g) $\sqrt{8}-6\sqrt{2}+\sqrt{24}$
h) $\sqrt{50}+3\sqrt{18}-10\sqrt{3}$
i) $7\sqrt{4x}-2\sqrt{9x}+6\sqrt{49x}$
j) $3\sqrt{2x}+4\sqrt{8x}-\sqrt{32x}$

5. Simplify:

a) $\dfrac{\sqrt{14}}{\sqrt{7}}$ b) $\dfrac{\sqrt{18}}{\sqrt{3}}$ c) $\dfrac{27\sqrt{15}}{3\sqrt{5}}$ d) $\dfrac{5\sqrt{72}}{\sqrt{24}}$ e) $\dfrac{\sqrt{50}}{\sqrt{2}}$

6. Rationalize the denominator:

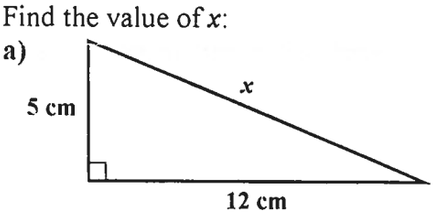
a) $\dfrac{\sqrt{5}}{\sqrt{3}}$ b) $\dfrac{\sqrt{7}}{\sqrt{2}}$ c) $\dfrac{2}{\sqrt{2}}$ d) $\dfrac{3\sqrt{5}}{2\sqrt{6}}$ e) $\dfrac{2\sqrt{3}}{\sqrt{6}}$

7. Simplify:

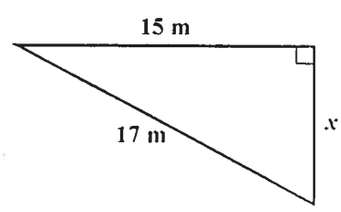
a) $2\sqrt{5}(\sqrt{3}+\sqrt{7})$
b) $4\sqrt{3}(7\sqrt{2}-3\sqrt{7})$
c) $9\sqrt{3}(2\sqrt{15}-3\sqrt{10})$
d) $\sqrt{2}(4\sqrt{6}-2\sqrt{14})$
e) $\dfrac{2\sqrt{6}+4\sqrt{21}}{\sqrt{3}}$
f) $\dfrac{4\sqrt{15}-10\sqrt{30}}{2\sqrt{5}}$

8. Find the value of x:

a)



b)



9. A ladder is leaning against a wall. The foot of the ladder is 10m from the base of the wall, and the ladder reaches 6m up the wall. How high is the ladder?

10. A shadow is cast by a building. The distance from the tip of the shadow to the top of the building is 85m. The tip of the shadow is 55m from the base of the building. How tall is the building?

ANSWERS

1a) 4 b) 9 c) 2 d) 7 e) 11

2a) $\sqrt{12}$ b) $\sqrt{50}$ c) $\sqrt{99}$ d) $\sqrt{300}$ e) $\sqrt{242}$

3a) $2\sqrt{3}$ b) $3\sqrt{2}$ c) $2\sqrt{5}$ d) $4\sqrt{2}$ e) $3\sqrt{5}$
f) $5\sqrt{3}$ g) $6\sqrt{3}$ h) $10\sqrt{2}$ i) $30\sqrt{2}$ j) 32

4a) $2\sqrt{2}+9\sqrt{11}$ b) $3\sqrt{5}+\sqrt{7}$ c) $6\sqrt{3}-5$ d) $5\sqrt{3}$ e) $2\sqrt{2}$
f) $11\sqrt{2}$ g) $2\sqrt{6}-4\sqrt{2}$ h) $14\sqrt{2}-10\sqrt{3}$ i) $50\sqrt{x}$ j) $7\sqrt{2x}$

5a) $\sqrt{2}$ b) $\sqrt{6}$ c) $9\sqrt{3}$ d) $5\sqrt{3}$ e) 5

6a) $\dfrac{\sqrt{15}}{3}$ b) $\dfrac{\sqrt{14}}{2}$ c) $\sqrt{2}$ d) $\dfrac{\sqrt{30}}{4}$ e) $\sqrt{2}$

7a) $2\sqrt{15}+2\sqrt{35}$ b) $28\sqrt{6}-12\sqrt{21}$ c) $54\sqrt{5}-27\sqrt{30}$
d) $8\sqrt{3}-4\sqrt{7}$ e) $2\sqrt{2}+4\sqrt{7}$ f) $2\sqrt{3}-5\sqrt{6}$

8a) 13 cm b) 8 m 9. $2\sqrt{34}$ m 10. $10\sqrt{42}$ m