**Identify if the evaluated expressions will be rational or irrational.**

|  |  |  |  |
| --- | --- | --- | --- |
| **1.**  | $$π+2$$ | **2.**  | $$\sqrt{7}-\sqrt{6}$$ |
|  |  |  |  |
| **3.**  | $$\sqrt{15}×\frac{1}{\sqrt{15}} $$ | **4.**  | $$\sqrt{5}÷\sqrt{2}$$ |
|  |  |  |  |
| **5.**  | $$32π+\left(0.5π+12,35\right)$$ | **6.**  | $$3-\sqrt{8}$$ |
|  |  |  | $$ $$ |
| **7.**  | $$\sqrt{111}×\frac{1}{\sqrt{111}}+1 $$ | **8.**  | $$\sqrt{31}-\sqrt{31}+\sqrt{31}$$ |
|  |  |  |  |
| **9.**  | $$\left(1.237-8\right)×\frac{1}{\sqrt{12}} $$ | **10.**  | $$\sqrt{7}×\sqrt{7}×\sqrt{7}×\sqrt{7}$$ |
|  |  |  |  |
| **11.**  | $$12-\left(\sqrt{41}\right)^{3} $$ | **12.**  | $$\sqrt{133}÷\sqrt{133}×\sqrt{133}$$ |
|  |  |  |  |

**Find a rational and an irrational number with a value between each given pairs of numbers.**

|  |  |  |  |
| --- | --- | --- | --- |
| **13.**  | $$4 and 5$$ | **14.**  | $$5 and 7$$ |
|  |  |  |  |
| **15.**  | $$11 and 13$$ | **16.**  | $$5 and 6$$ |
|  |  |  |  |
| **17.**  | $$10 and 11$$ | **18.**  | $$45 and 46$$ |
|  |  |  |  |
| **19.**  | $$8 and 9$$ | **20.**  | $$15 and 16$$ |
|  |  |  |  |

**ANSWERS**

**Identify if the evaluated expressions will be rational or irrational.**

|  |  |  |  |
| --- | --- | --- | --- |
| **1.**  | $$π+2$$ | **2.**  | $$\sqrt{7}-\sqrt{6}$$ |
|  | $$π+2=3.14159……+2=5.14158…..$$**Irrational** |  | $$\sqrt{7}-\sqrt{6}=2.64575…-2.4494……$$$$\sqrt{7}-\sqrt{6}=2.6454………$$**Irrational** |
| **3.**  | $$\sqrt{15}×\frac{1}{\sqrt{15}} $$ | **4.**  | $$\sqrt{5}÷\sqrt{2}$$ |
|  | $$\sqrt{15}×\frac{1}{\sqrt{15}}=1$$**Rational** |  | $$ \sqrt{5}÷\sqrt{2}$$$$2.2360….÷1.41421...=1.58109………$$**Irrational** |
| **5.**  | $$32π+\left(0.5π+12.35\right)$$ | **6.**  | $$3-\sqrt{8}$$ |
|  | $$ 32π+\left(0.5π+12.35\right)=$$$$=32\*π+\left(0.5\*3.14159+12.35\right)…….$$$$=32\*π+\left(1.5708…..+12.35\right)$$$$=32\*π+13.9207…..$$$$=32\*3.14159……+13.9207…..$$$$=100.5309..……+13.9207…$$$$=114.4516……..$$**Irrational** |  | $$ \left(3-\sqrt{8}\right)+12=$$$$=\left(3-2.8284…..\right)+12$$$$=0.1715…….+12$$$$=12.1715…….$$**Irrational** |
| **7.**  | $$\sqrt{111}×\frac{1}{\sqrt{111}}+1 $$ | **8.**  | $$\sqrt{31}-\sqrt{31}+\sqrt{31}$$ |
|  | $$ \sqrt{111}×\frac{1}{\sqrt{111}}+1=$$$$=1+1=$$$$=2$$**Rational** |  | $$ \sqrt{31}-\sqrt{31}+\sqrt{31}=$$$$=0+\sqrt{31}$$$$=\sqrt{31}$$**Irrational** |
| **9.**  | $$\left(1.237-8\right)×\frac{1}{\sqrt{12}} $$ | **10.**  | $$\sqrt{7}×\sqrt{7}×\sqrt{7}×\sqrt{7}$$ |
|  | $$\left(1.237-8\right)×\frac{1}{\sqrt{12}}=$$$$=-6.7621.×\frac{1}{\sqrt{4×3}}=$$$$=-6.7621×\frac{3(2)}{(2)\sqrt{3}}=$$$$=-6.7621×\frac{3}{\sqrt{3}}$$$$=-20.2863×\frac{1}{\sqrt{3}}$$**Irrational** |  | $$ \sqrt{7}×\sqrt{7}×\sqrt{7}×\sqrt{7}=$$$$=7×7$$$$=49$$**Rational** |
| **11.**  | $$12-\left(\sqrt{41}\right)^{3} $$ | **12.**  | $$\sqrt{133}÷\sqrt{133}×\sqrt{133}$$ |
|  | $$ 12-\left(\sqrt{41}\right)^{3}=$$$$=12-41\sqrt{41}….=$$$$=12-41×6.4031……$$$$=12-262.5280……$$$$=-250.5280…$$**Irrational** |  | $$\sqrt{133}÷\sqrt{133}×\sqrt{133}=$$$$=1×\sqrt{133}$$$$=\sqrt{133}$$**Irrational** |

**Find a rational and an irrational number with a value between each given pairs of numbers.**

|  |  |  |  |
| --- | --- | --- | --- |
| **13.**  | $$4 and 5$$ | **14.**  | $$5 and 7$$ |
|  | $$\frac{4+5}{2}=\frac{9}{2}=4.5 Rational $$$$\sqrt{4×5}=2\sqrt{5} Irrational$$ |  | $$\frac{5+7}{2}=\frac{12}{2}=6 Rational $$$$\sqrt{5×7}=\sqrt{35} Irrational$$ |
| **15.**  | $$11 and 13$$ | **16.**  | $$5 and 6$$ |
|  | $$\frac{11+13}{2}=\frac{24}{2}=12 Rational $$$$\sqrt{11×13}=\sqrt{143} Irrational$$ |  | $$\frac{5+6}{2}=\frac{11}{2}=5.5 Rational $$$$\sqrt{5×6}=\sqrt{30} Irrational$$ |
| **17.**  | $$10 and 11$$ | **18.**  | $$45 and 46$$ |
|  | $$\frac{10+11}{2}=\frac{21}{2}=10.5 Rational $$$$\sqrt{10×11}=\sqrt{110} Irrational$$ |  | $$\frac{45+46}{2}=\frac{91}{2}=45.5 Rational $$$$\sqrt{45×46}=\sqrt{2,070} Irrational$$ |
| **19.**  | $$8 and 9$$ | **20.**  | $$15 and 16$$ |
|  | $$\frac{8+9}{2}=\frac{17}{2}=8.5 Rational $$$$\sqrt{8×9}=6\sqrt{2} Irrational$$ |  | $$\frac{15+16}{2}=\frac{31}{2}=15.5 Rational $$$$\sqrt{15×16}=4\sqrt{15} Irrational$$ |