UNIT 4

Rational #'s - whole #s, fractions, decimals that repeat or have a pattern or stops

ex. $2, -3, \frac{2}{3}, \frac{1}{9}, \sqrt{4}, 4.33333$
$1.125, 2.171717$

Irrational #'s - decimals that do not repeat or have a pattern.

ex. $\pi, \sqrt{3}, 4.621538267\ldots$

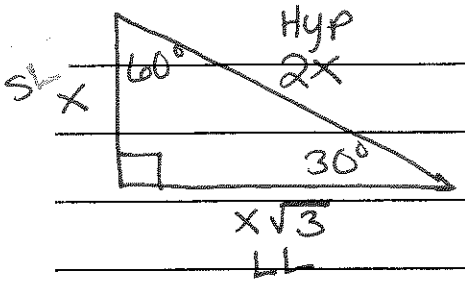
Reducing Radicals ex. $\sqrt{24}$

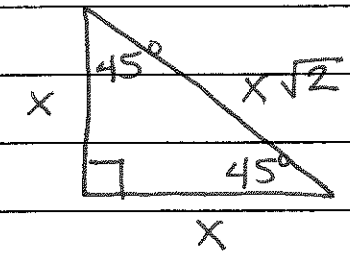
$24 = 2 \cdot 12$
$12 = 2 \cdot 6$
$6 = 2 \cdot 3$
$2, 2, 3$
$2\sqrt{6}$

ex. $\sqrt{108}$

$108 = 2 \cdot 54$
$54 = 2 \cdot 27$
$27 = 3 \cdot 9$
$9 = 3 \cdot 3$
$2, 3, 3$
$2 \cdot 3\sqrt{3}$
$6\sqrt{3}$

special Right Δ's

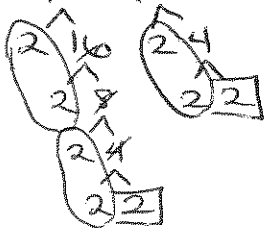




Unit 4 – State Practice Test Problems Name: _____

1. **Which expression is equivalent to $\sqrt{32}-\sqrt{8}$?**

   A. $2\sqrt{2}$
   B. $6\sqrt{2}$
   C. $2\sqrt{6}$
   D. $2\sqrt{10}$



$4\sqrt{2}-2\sqrt{2}$

$2\sqrt{2}$

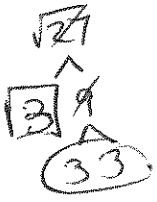
2. **Which expression is equivalent to $\sqrt{\frac{16}{27}}$?**

   A. $\frac{4\sqrt{3}}{3}$
   B. $\frac{2\sqrt{3}}{3}$
   C. $\frac{3\sqrt{3}}{4}$
   D. $\frac{4\sqrt{3}}{9}$

$\frac{\sqrt{16}}{\sqrt{27}} = \frac{4}{3\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$= \frac{4\sqrt{3}}{3\sqrt{9}} = \frac{4\sqrt{3}}{3\cdot 3}$

$= \frac{4\sqrt{3}}{9}$



3. **Which expression has a value that is a rational number?**

   A. $\sqrt{10}+16$
   B. $2\left(\sqrt{5}+\sqrt{7}\right)$
   C. $\sqrt{9}+\sqrt{4}$ $3+2=5$
   D. $\sqrt{3}+0$

I R $I \cdot R = I$

4. **Which statement is true about the value of $\left(\sqrt{8}+4\right)\cdot 4$?**

   A. It is rational, because the product of two rational numbers is rational.
   B. It is rational, because the product of a rational number and an irrational number is rational.
   C. It is irrational, because the product of two irrational numbers is irrational.
   D. It is irrational, because the product of an irrational number and a rational number is irrational.

5. **Let a be a nonzero rational number and b be an irrational number. Which of these MUST be a rational number?**

$a = 2$
$b = \pi$

A. $b \div 0$ $\pi + 0 = \pi$
B. $a \div a$ $2 + 2 = 4$
C. $a \div b$ $2 + \pi$
D. $b \div b$ $\pi + \pi$

6. **What is the product of $7x - 4$ and $8x + 5$?**

A. $15x + 1$
B. $30x + 2$
C. $56x^2 + 3x - 20$
D. $56x^2 - 3x + 20$

Distribute

$(7x-4)(8x+5)$

$56x^2 + 35x$
$-32x - 20$
$56x^2 + 3x - 20$

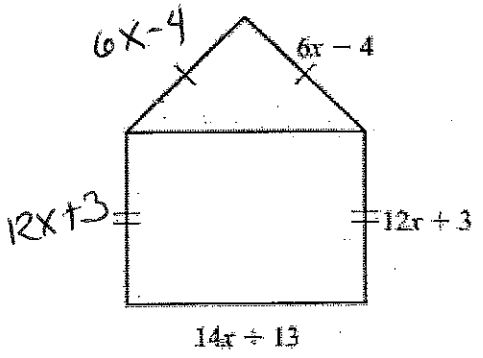
OR

BOX

	$7x$	-4
$8x$	$56x^2$	$-32x$
5	$35x$	-20

$56x^2 + 3x - 20$

7. **A model of a house is shown.**



$6x - 4$
$6x - 4$
$12x + 3$
$12x + 3$
$+ \quad 14x + 13$
$50x + 11$

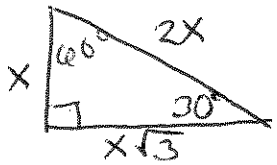
What is the perimeter, in units, of the model?

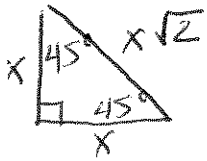
A. $32x + 12$
B. $46x + 25$
C. $50x + 11$
D. $64x + 24$

8. **Which has the same value as the expression $(8x^2 + 2x - 6) - (5x^2 - 3x + 2)$?**

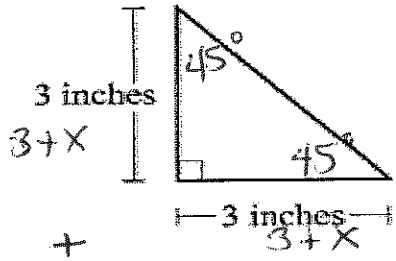
$8x^2 + 2x - 6$
$-5x^2 + 3x - 2$
$3x^2 + 5x - 8$

A. $3x^2 - x - 4$
B. $3x^2 + 5x - 8$
C. $13x^2 - x - 8$
D. $13x^2 - 5x - 4$





9. **Kelly makes two different-sized ceramic tiles in the shape of right isosceles triangles. This diagram shows the leg lengths of the small tile.**



Hyp = leg $(\sqrt{2})$
$= (x+3)(\sqrt{2})$

Kelly makes a larger tile by increasing the length of each leg of the small tile by x inches. Which expression represents the length, in inches, of the hypotenuse of the large tile?

A. $18 \div x$

B. $(x+3)^2$

C. $(x+3)\sqrt{2}$

D. $3\sqrt{2} + x$

look for it to be irrational

10. Which of the following is an irrational number?

R (A) The sum of 3 and 0.111....

R (B) The product of $2\sqrt{3}$ and width $\frac{1}{\sqrt{3}}$ $\frac{2\sqrt{3}}{1} \cdot \frac{1}{\sqrt{3}} = 2$

R (C) The product of $\sqrt{16}$ and $\sqrt{9}$ $4 \cdot 3 = 12$

I (D) The sum of $\sqrt{3}$ and $0.\overline{3}$ $= 2.065384141\ldots$

11. Which of the following is not a rational number?

(A) The product of 2 and $0.\overline{3}$

(B) The sum of $2 + \sqrt{3}$ and $5 - \sqrt{3}$

(C) The sum of $\frac{3}{7}$ and $\frac{1}{2}$

(D) The product of 2 and $\sqrt{2}$

12. If $2x^2 - 5x + 7$ is subtracted from $4x^2 + 2x - 11$, what is the coefficient of x in the result?

(A) 2

(B) 7

(C) –3

(D) –18

$(4x^2+2x-11) - (2x^2-5x+7)$

$4x^2+2x-11$
$-2x^2+5x-7$
$2x^2+7x-18$

13. What is the resulting polynomial when $3x + 7$ is multiplied by $2x - 6$?

(A) $5x + 1$

(B) $6x - 42$

(C) $6x^2 - 4x - 42$

(D) $6x^2 + 9x - 42$

$(3x+7)(2x-6)$

$6x^2 - 18x$
$+14x - 42$
$6x^2 - 4x - 42$