Name _____ Date _____ Hour _____

DIRECTIONS

- Complete the following problems in this packet in the space provided <u>without a calculator</u> (unless specified otherwise within). Please use <u>pencil</u>! Show your work for full credit.

- If you need instruction or a review of the topics in this packet, go to <u>http://www.khanacademy.org/</u>. These are excellent videos that will re-teach and remind you how to go about the problems in this packet. You may also research online for websites or other videos.

- Circle or box your answers so that they can easily be identified or write them on the line.

- Bring this completed packet of problems with you to class on the first day of school. It will be collected! You should expect to have a quiz the first week of school over this review material.

FRACTIONS

1 – 10. Multiply or divide the fractions. Reduce your answer to lowest terms.

1. $\dfrac{2}{3} \cdot \dfrac{5}{7}$	**2.** $\dfrac{4}{5} \div \dfrac{3}{20}$	**3.** $\dfrac{5}{7} \cdot \dfrac{35}{3}$	**4.** $\dfrac{6}{11} \div \dfrac{3}{4}$	**5.** $\dfrac{\frac{4}{9}}{\frac{8}{9}}$
6. $\dfrac{32}{5} \cdot \dfrac{7}{8}$	**7.** $\dfrac{4}{3} \cdot \dfrac{11}{7}$	**8.** $\dfrac{\frac{3}{8}}{\frac{8}{5}}$	**9.** $\dfrac{2}{5} \div \dfrac{14}{15}$	**10.** $\dfrac{4}{11} \div \dfrac{11}{4}$

RADICALS

11 – 20. Simplify the radicals. Answers should not have radicals in the denominator.

11. $\sqrt{45}$	**12.** $5\sqrt{10} \cdot 3\sqrt{2}$	**13.** $\dfrac{3}{\sqrt{7}}$	**14.** $\dfrac{5\sqrt{7}}{\sqrt{2}}$	**15.** $\dfrac{\frac{2}{\sqrt{2}}}{\frac{1}{2}}$
16. $\dfrac{\sqrt{6}}{\sqrt{2}}$	**17.** $\dfrac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$	**18.** $7\sqrt{20} \cdot 2\sqrt{3}$	**19.** $\dfrac{4\sqrt{3}}{\sqrt{2}}$	**20.** $\sqrt{180}$

FACTORING

21 – 34. Factor the binomial or trinomial.

_____ **21.** $x^2 + 6x + 5$ 　　　　　 _____ **22.** $10x^2 + 13x - 3$

_____ **23.** $2x^2 + 7x + 6$ 　　　　　 _____ **24.** $x^2 - 7x + 12$

_____ **25.** $x^2 - 4x - 12$ 　　　　　 _____ **26.** $x^2 - 81$

_____ **27.** $12x^2 + 16x - 3$ 　　　　 _____ **28.** $x^2 + 11x - 12$

_____ **29.** $8x^2 + 2x - 3$ 　　　　　 _____ **30.** $25x^2 - 49$

_____ **31.** $2x^2 + 11x + 15$ 　　　　 _____ **32.** $x^2 - 10x + 24$

_____ **33.** $3x^2 + x - 10$ 　　　　　 _____ **34.** $10x^2 + 17x + 3$

ADDING AND SUBTRACTING RATIONAL EXPRESSIONS

35 – 40. Add or subtract the fractions using the least common denominator (LCD).

35. $\dfrac{2}{x+4} + \dfrac{3}{5}$ 　　　　 **36.** $\dfrac{4}{x-2} - \dfrac{3}{x+5}$ 　　　　 **37.** $\dfrac{2}{x} + \dfrac{7}{x+8}$

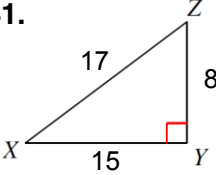**38.** $\dfrac{x}{x+1} - \dfrac{5}{x-3}$ 　　　　 **39.** $\dfrac{1}{3} + \dfrac{3}{x} + \dfrac{4}{x^2}$ 　　　　 **40.** $\dfrac{x}{5(x+2)} + \dfrac{3}{x+2}$
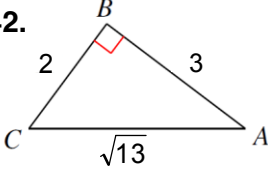
FINDING TRIGONOMETRIC RATIOS (SOH CAH TOA)

41 – 42. Find the trigonometric ratios. Leave your answer as a fraction. Simplify radicals.

41.

$\sin Z =$
$\cos Z =$
$\tan Z =$

42.

$\sin C =$
$\cos C =$
$\tan C =$

PYTHAGOREAN TRIPLES

MEMORIZE these Pythagorean triples that are commonly used in trigonometry.

*(A Pythagorean triple is a set of three positive integers that satisfy the Pythagorean Theorem.)*

3, 4, 5	6, 8, 10	5, 12, 13	8, 15, 17	7, 24, 25

RIGHT TRIANGLES – REAL LIFE APPLICATIONS WITH TRIG RATIOS (SOH CAH TOA)

EXAMPLE

A. A surveyor is standing 115 feet from the base of the Washington Monument. The surveyor measures the angle of elevation to the top of the monument as $78.3°$.

- Draw and label a right triangle.
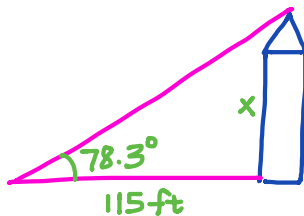
- How tall is the Washington Monument?
  - Decide which trigonometric function to use
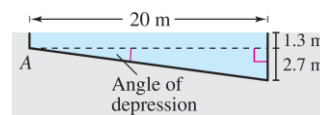 - Cross multiply and make sure you are in DEGREE mode

$$\tan 78.3° = \frac{x}{115}$$
$$x = 115 \cdot \tan 78.3°$$
$$\boxed{x = 555.31 \ ft}$$

43. A ladder 20 feet long leans against the side of a house. Find the height from the top of the ladder to the ground if the angle of elevation of the ladder is $80°$.

44. A swimming pool is 20 m long and 12 m wide. The bottom of the pool is slanted so that the water depth is 1.3 m at the shallow end and 4 m at the deep end. Find the angle of depression.
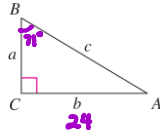

Note: To find an angle measurement, use the 2nd button.

45 – 48. **Solve the right triangle – find all the sides and all the angles.**
Use a CALCULATOR to round to 2 digits past the decimal point.

EXAMPLES

A. $\angle B = 71°, \ b = 24$

$\angle A = 180° - 90° - 71° = 19°$

$\tan 71° = \dfrac{24}{a}$

$\dfrac{a \cdot \tan 71°}{\tan 71°} = \dfrac{24}{\tan 71°}$

$a = 8.26$

$\sin 71° = \dfrac{24}{c}$

$\dfrac{c \cdot \sin 71°}{\sin 71°} = \dfrac{24}{\sin 71°}$

$c = 25.38$

$\angle A = 19°$	$\angle B = 71°$	$\angle C = 90°$
$a = 8.26$	$b = 24$	$c = 25.38$

B. $b = 12, \ c = 20$
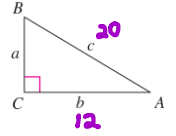
$a^2 + 12^2 = 20^2$
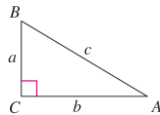
$a^2 + 144 = 400$

$a = 16$

To find an angle measurement, use the
2ND button on your calculator

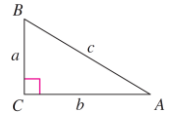$\cos A = \dfrac{12}{20} \longrightarrow \cos^{-1}\left(\dfrac{12}{20}\right) = 53.13°$

$\angle A = 53.13°$	$\angle B = 36.87°$	$\angle C = 90°$
$a = 16$	$b = 12$	$c = 20$

45. $\angle A = 52°, \ c = 15$

$\angle A =$	$\angle B =$	$\angle C =$
$a =$	$b =$	$c =$

46. $a = 6, \ b = 10$

$\angle A =$	$\angle B =$	$\angle C =$
$a =$	$b =$	$c =$

47. $a = 4, c = 9$

$\angle A =$	$\angle B =$	$\angle C =$
$a =$	$b =$	$c =$

48. $\angle B = 20°, \ a = 30$

$\angle A =$	$\angle B =$	$\angle C =$
$a =$	$b =$	$c =$