

Third Exam

Take home

Due: Monday, April 11

- One leg of a right triangle is 2 cm more than the other. If the hypotenuse is $\sqrt{7}$ cm
 - find the lengths of the two legs.
 - Find the measures of the two acute angles of the triangle.
- Simplify: $3\sqrt{28} - \sqrt{700} + 4\sqrt{63}$
- Simplify: $\frac{(3 - \sqrt{2})^2}{1 + \sqrt{2}}$
- Simplify, assuming all variables represent positive numbers: $\sqrt{\frac{9b^8c^3}{20a^7}}$
- Simplify assuming all variables represent positive numbers. The answer should contain only positive integers as exponents.

$$\left(\frac{x^{21}y^{-\frac{15}{4}}}{z^{-\frac{9}{2}}}\right)^{-\frac{2}{3}}$$

- Solve: $x - \sqrt{x - 4} = 10$
- Solve: $\sqrt{x} - \sqrt{x - 9} = 1$
- Simplify. Express your answer in the form $a + bi$ where a and b are real numbers.

$$\frac{(2 - 3i)(i + 1) + 2 + 12i}{3 - 5i}$$

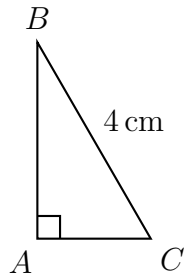
- Simplify: $\frac{x^2 + 10x + 25}{x^2 + 2x - 15}$
- Divide : $\frac{x^2 - 4}{x^2 + x - 6} \div \frac{x^2 + 7x + 10}{x^2 + 8x + 15}$. Simplify the result as much as possible.
- Combine: $\frac{2}{x} - \frac{2x - 3}{x^2 - 25} + \frac{5}{x - 5}$. Simplify the result as much as possible.
- Simplify: $\frac{\frac{a}{a - 3} - \frac{3}{a + 3}}{1 + \frac{18}{a^2 - 9}}$

13. Solve: $\frac{1}{x^2} - 15 = -\frac{2}{x}$

14. Solve: $\frac{2}{x+7} + 2 = \frac{1}{x-3} - \frac{4x+48}{x^2+4x-21}$

15. Solve the triangle ABC , using the given information:

$A = 90^\circ$ $a = 4 \text{ cm}$
 $B = 30^\circ$ $b =$
 $C =$ $c =$



16. A hot-air balloon rises vertically. An observer stands on level ground at a distance of 125 feet from a point on the ground directly below the passenger's compartment. How high, to the nearest foot, is the balloon if the angle of elevation is 20° ?

17. An angle θ has $\tan \theta = 1.1917536$.

(a) Based on this information in which quadrants can the terminal point of θ lie?

(b) Find all possible such angles θ , with $0^\circ \leq \theta < 360^\circ$.

18. A point has coordinates $(-2, 5)$. Find its angle of reference.

19. A point is at distance 7 from the origin and has angle of reference 140° . Find its coordinates.

20. Find the length of the arc α , where the corner of the angle is at the center of the circle. Give an exact answer.

