

Name: _____

You must show all work to receive full and partial credit. Good Luck.

No Calculator

(1) Check to see if the given number is a solution for the given equation.

4

(a) $x^2 - 15 = 2x$; check $x = -3$

$$\begin{aligned} (-3)^2 - 15 &= 2(-3) \\ 9 - 15 &= -6 \\ -6 &= -6 \checkmark \\ x &= -3 \text{ a sol.} \end{aligned}$$

(b) $2(y - 4) = -6y + 56$; check $y = 9$

$$\begin{aligned} 2(9 - 4) &= -6(9) + 56 \\ 2(5) &= -54 + 56 \\ 10 &= 2 \text{ false} \\ y = 9 &\text{ not a sol.} \end{aligned}$$

(2) Solve and check.

4

$$7x + 2 + 5x + 6 = 11x + 4$$

$$\begin{aligned} 12x + 8 &= 11x + 4 \\ x + 8 &= 4 \\ x &= -4 \end{aligned}$$

check:

$$\begin{aligned} 7(-4) + 2 + 5(-4) + 6 &= 11(-4) + 4 \\ -28 + 2 - 20 + 6 &= -44 + 4 \\ -48 + 8 &= -40 \\ -40 &= -40 \checkmark \end{aligned}$$

(3) Solve.

12

$$2(m - 22) + 4(m - 3) = 40$$

$$2m - 44 + 4m - 12 = 40$$

$$6m - 56 = 40$$

$$6m = 96$$

$$m = 16$$

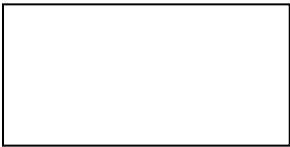
12

(4) Translate to an equation, then solve.

Three times the difference of b and seven is equal to eleven plus seven times b .

$$\begin{aligned} 3(b-7) &= 11 + 7b \\ 3b - 21 &= 11 + 7b \\ -4b &= 32 \\ b &= -8 \end{aligned}$$

(5) The perimeter of a college basketball court is 108 meters and the length is twice as long as the width. What are the length and width?



$$\begin{aligned} \text{length} &= 2w = 36\text{m} & 108 &= 2w + 2(2w) \\ \text{width} &= w = 18\text{m} & 108 &= 6w \\ & & 18 &= w \end{aligned}$$

(6) In a Triangle, the second angle is 5 times the first angle and the third angle is 19° less than 4 times the first angle. Find the size of the angles if the sum of the measures of three angles is 180° .

$$\begin{aligned} 1^{\text{st}} \text{ angle} &= x = 19.9^\circ & x + 5x + 4x - 19 &= 180 \\ 2^{\text{nd}} \text{ angle} &= 5x = 99.5^\circ & 10x - 19 &= 180 \\ 3^{\text{rd}} \text{ angle} &= 4x - 19 = 60.6^\circ & 10x &= 199 \\ & & x &= 19.9 \end{aligned}$$

(7) Simplify by dividing.

(a) $\frac{-5}{0} = \text{undefined}$

(b) $\frac{0}{2} = 0$

(c) $\frac{-33}{-33} = 1$

2

(8) find the missing numerator so that the fractions will be equal.

(a) $\frac{7}{9} = \frac{?}{18}$

$? = 14$

(b) $\frac{21}{36} = \frac{?}{12}$

$? = 7$

4

(9)

(a) Write the improper fraction as a mixed number.

$\frac{64}{9} = 7\frac{1}{9}$

(b) Write the mixed number as an improper fraction.

$2\frac{5}{6} = \frac{17}{6}$

(10) Reduce the fractions to lowest terms.

4

$$\frac{\frac{2}{-18c^4d^6}}{\frac{81c^3d^9}{9}} = \frac{-2}{9c^3d}$$

4

(11) Divide. Write answers in lowest terms.

$$(a) \frac{28y^5}{7w^4z} \div \frac{-16y^2}{14w^2z} = \frac{14y^3}{28y^2} \cdot \frac{14w^2z}{-16y^2} = -\frac{7y^3}{2w^2}$$

(b) $15.4x^6 \div 5.5x^4$

14

20 (12) Multiply. Write answer in lowest terms.

$$(a) \frac{\cancel{x^2}^3 \cdot \cancel{30}^3 y^4}{\cancel{20}^2 z \cdot \cancel{x^5}^3 z} = - \frac{3y^3}{x^3 z^2}$$

$$(b) \left(-4\frac{1}{3}\right) \cdot \left(-\frac{5}{6} \frac{13}{3}\right) \left(-\frac{17}{6}\right)$$

$$= \frac{221}{18}$$

$$(c) \left(-\frac{1}{\cancel{15}^3} b\right) \left(\frac{\cancel{8}^3}{6} b^8\right) = -\frac{1}{18} b^9$$

$$(d) \left(\frac{x^6}{3}\right)^2 = \frac{x^{12}}{9}$$

$$(e) \left(x - \frac{1}{5}\right) \left(x + \frac{1}{15}\right) = x^2 + \frac{1}{15}x - \frac{1}{5}x - \frac{1}{75}$$

$$= x^2 + \frac{1}{15}x - \frac{2}{15}x - \frac{1}{75}$$

$$= x^2 - \frac{2}{15}x - \frac{1}{75}$$

20

4

(13) Subtract. Write answer in lowest terms.

$$\begin{aligned}
 -5\frac{1}{4} - 7\frac{3}{5} &= -\frac{21}{4} - \frac{38}{5} \\
 &= -\frac{105}{20} - \frac{152}{20} \\
 &= -\frac{257}{20}
 \end{aligned}$$

8

(14) Subtract.

$$\begin{aligned}
 \text{(a)} \quad \frac{8n^2+13}{7m} - \frac{3n^2+2}{7m} &= \frac{8n^2+13-(3n^2+2)}{7m} \\
 &= \frac{8n^2+13-3n^2-2}{7m} \\
 &= \frac{5n^2+11}{7m}
 \end{aligned}$$

$$\text{(b)} \quad \frac{2}{3n^2} - \frac{2}{15n} = \frac{10}{15n^2} - \frac{2n}{15n^2}$$

$$\begin{aligned}
 \text{LCD} &= 15n^2 \\
 &= \frac{10-2n}{15n^2}
 \end{aligned}$$

4

(15) Add. Write answer in lowest terms.

$$\begin{aligned}
 \text{(a)} \quad &\left(3y^3 - \frac{4}{7}y^2 + 7 - \frac{1}{6}\right) + \left(y^3 + 4y^2 - \frac{1}{3}\right) \\
 &= \left(3y^3 - \frac{4}{7}y^2 + \frac{42}{6} - \frac{1}{6}\right) + \left(y^3 + \frac{28}{7}y^2 - \frac{2}{6}\right) \\
 &= 4y^3 + \frac{24}{7}y^2 + \frac{39}{6} \\
 &= 4y^3 + \frac{24}{7}y^2 + \frac{13}{2}
 \end{aligned}$$

(16)

4 (16) Subtract. Write answer in lowest terms.

$$\left(\frac{2}{7}t^3 + \frac{2}{3}t^2 - \frac{1}{8}\right) - \left(\frac{4}{21}t^3 + \frac{1}{5}t^2 + \frac{1}{2}\right)$$

$$\left(\frac{6}{21}t^3 + \frac{10}{15}t^2 - \frac{1}{8}\right) + \left(-\frac{4}{21}t^3 - \frac{3t^2}{15} - \frac{4}{8}\right)$$

$$\frac{2}{21}t^3 + \frac{7}{15}t^2 - \frac{5}{8}$$

4 (17) Simplify.

$$\frac{2}{3} \div \left(-\frac{3}{2}\right) - 3\frac{2}{5} = \frac{2}{3} \div \left(-\frac{3}{2}\right) - \frac{17}{5}$$

$$= \frac{2}{3} \cdot \left(-\frac{2}{3}\right) - \frac{17}{5}$$

$$= -\frac{4}{9} - \frac{17}{5}$$

$$= -\frac{20}{45} - \frac{153}{45}$$

$$= \left(-\frac{173}{45}\right)$$

4 (18) Use the LCD to simplify the equation. Then solve the resulting equation.

$$\frac{1}{4} + z = \frac{2}{3}z - \frac{1}{2} \quad \text{LCD} = 12$$

$$12\left(\frac{1}{4} + z\right) = 12\left(\frac{2}{3}z - \frac{1}{2}\right)$$

$$3 + 12z = 8z - 6$$

$$3 + 4z = -6$$

$$4z = -9$$

$$z = -\frac{9}{4}$$

(12)

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Calculator Allowed

(1) Add.

4

$$(0.07x^5 - 0.7x^3 + x + 0.06) + (-0.02x^5 + x^4 - 0.8x - 0.04)$$

$$= 0.05x^5 + x^4 - 0.7x^3 + .2x + 0.02$$

(2) Multiply.

2 (a) $(0.2a^3)(-0.04a)$

$$= -0.008a^3$$

2 (b) $(0.4a^7)^2$

$$0.16a^{14}$$

3 (c) $0.5(1.1y^2 + 2.3y + 37) = 55y^2 + 1.15y + 18.5$

3 (d) $(x+1.14)(x-0.3) = x^2 - 0.3x + 1.14x - 0.342$

$$= x^2 + 0.84x - 0.342$$

4 (3) Simplify.

$$\sqrt{0.0064} + 143.5 \div 5(2.5 - 5.7)$$

$$= 0.08 + 143.5 \div 5(-3.2)$$

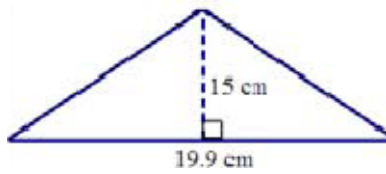
$$= 0.08 + 28.7(-3.2)$$

$$= 0.08 - 91.84$$

$$= -91.76$$

18

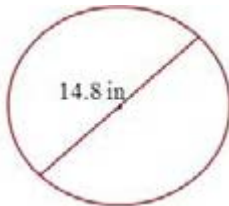
- 4 (4) Find the area of the triangle using the formula $A = \frac{1}{2}b \cdot h$



$$A = \frac{1}{2} (19.9)(15) \\ = 149.25 \text{ cm}^2$$

- 4 (5) Find the area of the circle using the formula $A = \pi r^2$. (Round to the nearest tenth as needed.)

(Use 3.14 for π)



$$A = 3.14$$

- 4 (6) Solve.

$$1.5(x + 8) = 6.4 + 0.8x$$

$$(7.4)^2$$

$$\approx 171.9 \text{ in}^2$$