

Chapter 4 - Equations - Exam Review

MPM1D

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Section 1: 4.1 Solving Simple Equations

1. Solve the following equations

a) $x + 4 = 7$

b) $y - 3 = 5$

c) $4m = 12$

d) $\frac{c}{3} = 2$

e) $g - 5 = -3$

f) $5u = -20$

g) $\frac{w}{5} = -2$

h) $5x + 3 = 13$

i) $7w - 3 = 11$

j) $-4h - 5 = -1$

k) $5r + 7 = 42$

l) $-3x + 5 = 8$

m) $8 + 7y = 15$

n) $-8x - 2 = 0$

o) $-6 + 4u = -3$

2. At a computer store, packages of DVDs sell for \$15 each. One customer buys \$120 worth of DVDs.

a) Write an equation to model the number of packages of DVDs the customer bought.

b) Solve the equation.

3. Solve each equation. Express fraction answers in lowest terms.

a) $3h + 4 = 6$

b) $5x - 3 = -2$

c) $-7w + 2 = -3$

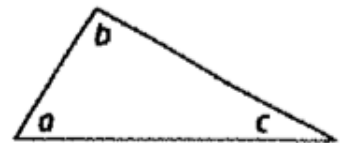
d) $-4d - 3 = -1$

e) $3r + \frac{2}{5} = -4$

f) $5t - 4 = \frac{2}{3}$

4. The equation $a + b + c = 180$ describes the sum of the angles in a triangle.

a) Use this formula to find the values of a , b and c when $b = 2a$ and $c = 3a$



b) Use this formula to find the values of a , b and c when $b = 3a$ and $c = 5a$

Section 2: 4.2 Solving Multi-Step Equations

5. Solve the following equations.

a) $5 + 3x + 4x = 19$

b) $15y - 6 - 10y = 9$

c) $32 = 5 - 4a - 5a$

d) $5m + 3 - 9m + 13 = 0$

e) $6w + 8 = 4w + 18$

f) $-8x - 5 = 2x + 15$

g) $3x - 6 = -x - 2$

h) $5 + 4x = -13 - 2x$

i) $14 - n - 7 = 5n + 1$

6. Find the root of each equation.

a) $5(x + 4) = 3x + 14$

b) $5x - 6 = 2(x + 3)$

c) $4y + 3(2 - y) = 13$

$$d) x = 3(5 - x) + 1$$

$$e) 3(r + 4) + 2(r + 5) = 32$$

$$f) 5(y - 3) - 3(y - 4) = 12$$

$$g) 4(x + 3) = 2(x + 6) - 8$$

$$h) 2(y - 4) = -3(y + 2) + 8$$

$$i) 0 = 4x + 3 - x - 9$$

7. Solve each equation. Express fraction answers in lowest terms.

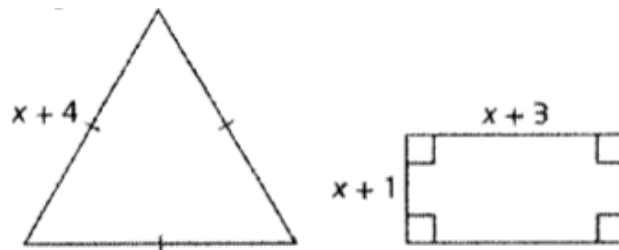
$$a) 5x - 2 = 2x + 3$$

$$b) 4 + 5x = x - 2$$

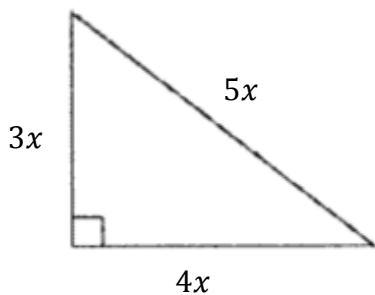
c) $4(x + 3) + 2(x - 3) = 3(x - 2)$

d) $7 - (4x + 3) = -3(x + 2) - (2x + 3)$

8. An equilateral triangle and a rectangle have the same perimeter. Find the side lengths of the equilateral triangle and the rectangle.



9. A family of right triangles has side lengths in the approximate ratio 3:4:5. One right triangle belonging to the family has a perimeter of 180 cm. Find its area. (Remember that the legs of a right triangle are the base and height)



Section 3: 4.3 Solving Equations Involving Fractions

10. Solve the following equations.

$$\text{a) } \frac{1}{4}(x - 3) = -2$$

$$\text{b) } 6 = -\frac{3}{5}(a - 7)$$

$$\text{c) } \frac{m+7}{5} = 3$$

$$\text{d) } 9 = \frac{3(x+4)}{2}$$

$$\text{e) } \frac{3x+5}{2} = 10$$

$$\text{f) } 1 = \frac{2y-3}{5}$$

$$\text{g) } \frac{x-4}{5} = \frac{x-3}{6}$$

$$\text{h) } \frac{x-2}{4} = \frac{x+1}{3}$$

$$\text{i) } \frac{1}{3}(x + 4) = \frac{1}{5}(x + 2)$$

$$\text{j) } \frac{1}{4}(x - 7) = \frac{1}{6}(x - 3)$$

$$\text{k) } \frac{2(x-5)}{3} = \frac{4(x+2)}{5}$$

$$\text{l) } \frac{3(x-4)}{4} = \frac{2(x-3)}{3}$$

11. Solve each equation **(this is bonus material!!!)**.

a) $\frac{2a}{3} + \frac{a-4}{5} = \frac{1}{2}$

b) $\frac{x+1}{2} + \frac{2x+3}{3} = \frac{x}{4}$

c) $\frac{w+3}{4} = \frac{w}{3} + \frac{2w-1}{5}$

12. The equation $F = \frac{9}{5}C + 32$ allows you to convert between Fahrenheit and Celsius temperatures.

a) The temperature at a resort is 30 degrees Celsius. What is the equivalent temperature in degrees Fahrenheit?

b) The temperature in the living room of a house is 77 degrees Fahrenheit. What is this equivalent to in degrees Celsius?

13. Find the base of a triangle with height 8 cm and area 72 cm²

Section 4: 4.4 Modeling With Algebra

14. Rearrange each formula to isolate the variable indicated

a) $C = \pi d$ for d

b) $d = vt$ for t

c) $A = P + I$ for I

d) $y = mx + b$ for m

e) $Ax + By + C = 0$ for y

f) $F = ma$ for a

g) $V = s^3$ for s

h) $P = I^2R$ for R

i) $V = \pi r^2 h$ for h

j) $P = 2l + 2w$ for l

k) $c^2 = a^2 + b^2$ for a

l) $A = \frac{1}{2}bh$ for h

15. The surface area, A , of a cube is related to the length of a side of the cube, s , by the formula $A = 6s^2$.

a) Rearrange this formula to express s in terms of A .

b) Find the length of the side of a cube with surface area 800 cm^2 . Round your answer to the nearest tenth of a centimeter.

Section 5: 4.5 Modeling With Algebra

16. Write an algebraic expression to represent each description.

a) quadruple a number

b) three more than a number

c) one third a number

d) four less than triple a number

e) six more than twice a number

f) three fifths of a number

17. Write an equation to represent each sentence, then solve the equation.

a) five times a number is 85

b) a number increased by 8 is 177

c) three more than double a number is 33

d) the sum of three consecutive integers is 168

18. Two friends are collecting pop-can tabs. Natasha has 250 more pop-can tabs than Krysten. Together they have collected 880 pop-can tabs. How many pop-can tabs has each friend collected?

19. Jacinth is 4 years older than her sister Naomi. The sum of their ages is 30. How old are the sisters?

20. The sum of three consecutive integers is 120. Find the numbers.

21. Anoja, Amani, and Azra are three friends who each have part-time jobs. Last week, Anoja earned twice as much money as Azra, while Amani earned \$25 more than Anoja. The total earnings of the three friends last week was \$450. How much money did each of them earn last week?

22. Raza works at a flea market selling sunglasses. He is paid \$7.50/h plus \$0.75 commission for every pair of sunglasses he sells.

a) Write an equation to model Raza's earnings.

b) Find Raza's earnings if he sells 25 pairs of sunglasses during a 6 hour shift.

c) How many pairs of sunglasses must he sell to earn \$90 in 8 hours.

Answers:

1) a) 3 b) 8 c) 3 d) 6 e) 2 f) -4 g) -10 h) 2 i) 2 j) -1 k) 7 l) -1 m) 1 n) $\frac{-1}{4}$ o) $\frac{3}{4}$

2) a) $15x = 120$ b) 8

3) a) $\frac{2}{3}$ b) $\frac{1}{5}$ c) $\frac{5}{7}$ d) $\frac{-1}{2}$ e) $\frac{-22}{15}$ f) $\frac{14}{15}$

4) a) 30 b) 20

5) a) 2 b) 3 c) -3 d) 4 e) 5 f) -2 g) 1 h) -3 i) 1

6) a) -3 b) 4 c) 7 d) 4 e) 2 f) $\frac{15}{2}$ g) -4 h) 2 i) 2

7) a) $\frac{5}{3}$ b) $\frac{-3}{2}$ c) -4 d) -13

8) $x = 4$, therefore sides of triangle = 8 ; rectangle is 7 by 5

9) 1350 cm²

10) a) -5 b) -3 c) 8 d) 2 e) 5 f) 4 g) 9 h) -10 i) -7 j) 15 k) -37 l) 12

11) a) $\frac{3}{2}$ b) $\frac{-18}{11}$ c) $\frac{57}{29}$

12) a) 86 b) 25

13) 18 cm

14) a) $d = \frac{c}{\pi}$ b) $t = \frac{d}{v}$ c) $I = A - P$ d) $m = \frac{y-b}{x}$ e) $y = \frac{-Ax-C}{B}$ f) $a = \frac{F}{m}$ g) $s = \sqrt[3]{V}$ h) $R = \frac{P}{I^2}$

i) $h = \frac{v}{\pi r^2}$ j) $l = \frac{P-2w}{2}$ k) $a = \sqrt{c^2 - b^2}$ l) $h = \frac{2A}{b}$

15) a) $s = \sqrt{\frac{A}{6}}$ b) 11.5 cm

16) a) $4x$ b) $x + 3$ c) $\frac{x}{3}$ d) $3x - 4$ e) $2x + 6$ f) $\frac{3x}{5}$

17) a) $5x = 85$ b) $x + 8 = 177$ c) $2x + 3 = 33$ d) $x + (x + 1) + (x + 2) = 168$

18) Krysten collected 315 tabs, Natasha collected 565 tabs

19) Jacinth is 17, Naomi is 13

20) 39,40,41

21) Anoja made \$170, Amani made \$195, Azra made \$85

22) a) $E = 7.5x + 0.75y$ b) \$63.75 c) 40 pairs