

Final Exam Unit 6 Review

1. Look at the algebraic expressions and equations below. Which are expressions? Equations? How do you know?

a) $5x = 65$ b) $\frac{0-4}{2}$ c) $3a - 6$ d) $z + 3 = 9$

Expression → has no equal sign!!
Equation → has equal sign!!

Solve by systematic trial.

a) $d + 9 = 23$ b) $\frac{p}{4} = 6$ c) $3c - 5 = 16$

a) $d + 9 = 23$

Guess	Check
4	$4 + 9 = 13$
10	$10 + 9 = 19$
15	$15 + 9 = 24$
14	$14 + 9 = 23 \checkmark$

$\therefore d = 14$

b) $\frac{p}{4} = 6$

Guess	Check
40	$\frac{40}{4} = 10$
30	$\frac{30}{4} = 7.5$
20	$\frac{20}{4} = 5$
24	$\frac{24}{4} = 6 \checkmark$

$\therefore p = 6$

c) $3c - 5 = 16$

Guess	Check
10	$3(10) - 5 = 25$
8	$3(8) - 5 = 19$
7	$3(7) - 5 = 16 \checkmark$

$\therefore c = 7$

3. Solve by inspection.

a) $5a = 35$ b) $3d + 7 = 19$ c) $p - 8 = 15$

a) $5a = 35$
 $a = 7$
because $5 \times 7 = 35$

b) $3d + 7 = 19$
 $d = 4$
because $12 + 7 = 19$
and $3 \times 4 = 12$

c) $p - 8 = 15$
 $p = 23$
because $23 - 8 = 15$

4. Write an equation you could use to solve the problem. Then solve it.

- a) Andrew lost 15 hockey cards. He has 27 left. How many hockey cards did he have to start with?
b) Abba bought 15 DVD's for \$240. She paid the same amount for each DVD. How much did Abba pay for each DVD?
c) Two more than three times a number is 17.
d) A number divided by four is 8.

a) $h - 15 = 27$
 $+15 \quad +15$
 $h = 42$

Verify:
 $h - 15 = 27$
 $42 - 15 = 27$

b) $15d = 240$
 $\frac{15d}{15} = \frac{240}{15}$
 $d = 16$

Verify:
 $15d = 240$
 $15(16) = 240$

c) $3n + 2 = 17$
 $-2 \quad -2$
 $\frac{3n}{3} = \frac{15}{3}$
 $n = 5$

Verify:
 $3n + 2 = 17$
 $3(5) + 2 = 17$
 $15 + 2 = 17$

d) $\frac{n}{4} = 8$
 $4 \times \frac{n}{4} = 8 \times 4$
 $n = 32$

Verify:
 $\frac{n}{4} = 8$
 $\frac{32}{4} = 8$

5. Sketch balance scales to represent each equation. Then solve and verify it.

i) $4a = 20$ ii) $z + 3 = 9$ iii) $2m + 1 = 13$

$a = 5$

$z = 6$

iii)

$m = 6$

6. Use tiles to solve each equation. Sketch the tiles you used.

a) $x + 5 = 11$ b) $a - 3 = 5$ c) $13 = x + 8$

$x = 6$ $a = 8$ $5 = x$
or
 $x = 5$

7. Solve by inspection. Show your work.

a) $p - 7 = 9$

b) $q + 8 = 27$

c) $3 = k - 8$

$p = 16$

because
 $16 - 7 = 9$

$q = 21$

because
 $21 + 8 = 27$

$k = 9$

because
 $9 - 6 = 3$

8. Solve each by writing an equation.

a) Overnight, the temperature dropped 6°C to -10°C .
What was the original temperature?

b) During the day, the temperature rose 7°C to $+2^{\circ}\text{C}$.
What was the original temperature?

a) $t - 6 = -10$
 $t = -4^{\circ}\text{C}$

b) $t + 7 = 2$
 $t = -5^{\circ}\text{C}$

9. Solve each equation using algebra.

a) $x - 29 = 13$

b) $8x = 72$

c) $7x = 49$

a) $x - 29 = 13$
 $+29 \quad +29$
 $x = 42$

Verify:

$x - 29 = 13$
 $42 - 29$
 13

b) $\frac{8x}{8} = \frac{72}{8}$
 $x = 9$

Verify:

$8x = 72$
 $8(9)$
 72

c) $\frac{7x}{7} = \frac{49}{7}$
 $x = 7$

Verify:

$7x = 49$
 $7(7)$
 49

10. Write an equation you can use to solve each problem below and solve it.

a) At a tennis court, it costs \$12 to rent equipment plus \$6/h to rent a court. How long can you play for \$30?

$$\begin{array}{r} a) \quad 6h + 12 = 30 \\ \quad \quad -12 \quad -12 \end{array}$$

$$\frac{6h}{6} = \frac{18}{6}$$

$$h = 3$$

You can play for 3 hours.

$$\begin{array}{r} b) \quad 12h + 15 = 75 \\ \quad \quad -15 \quad -15 \end{array}$$

$$\frac{12h}{12} = \frac{60}{12}$$

$$h = 5$$

You can fish for 5 hours.

11. A banquet hall charged \$120 for the rental of the hall, plus \$14 for each meal served. The total bill for the banquet was \$610. How many people attended the banquet?

Write, then solve, an equation to answer this question.

$$\begin{array}{r} 14p + 120 = 610 \\ \quad \quad -120 \quad -120 \end{array}$$

$$\frac{14p}{14} = \frac{490}{14}$$

$$p = 35$$

35 people attended this banquet.

Verify:

$$\begin{array}{r} 14p + 120 = 610 \\ 14(35) + 120 \\ 490 + 120 \\ 610 \end{array}$$

12. Marshall baked 33 cookies. He kept five for himself, and shared the rest equally among his friends. Each friend got 4 cookies.

Write, then solve, an equation you could use to find the number of friends who got cookies.

$$\begin{array}{r} 4f + 5 = 33 \\ \quad \quad -5 \quad -5 \end{array}$$

$$\frac{4f}{4} = \frac{28}{4}$$

$$f = 7$$

7 of Marshall's friends got cookies.

Verify:

$$\begin{array}{r} 4f + 5 = 33 \\ 4(7) + 5 \\ 28 + 5 \\ 33 \end{array}$$