Linear Equations

Ex 1 $x + 2 = 6$

$x + 2 - 2 = 6 - 2$

$x = 6 - 2$

$x = 4$

Ex 2 $x - 3 = 5$

$x - 3 + 3 = 5 + 3$

$x = 5 + 3$

$x = 8$

Ex 3 $2x = 10$

$\frac{2x}{2} = \frac{10}{2}$

$x = \frac{10}{2}$

$x = 5$

Ex 4 $\frac{x}{4} = 8$

$\frac{x}{4} \times 4 = 8 \times 4$

$x = 8 \times 4$

$x = 32$

Ex 5 $2x + 3 = 11$

$2x = 11 - 3$

$2x = 8$

$x = \frac{8}{2}$

$x = 4$

Ex 6 $3y - 5 = 7$

$3y = 7 + 5$

$3y = 12$

$y = \frac{12}{3}$

$y = 4$

Exercise

13) $2x + 5 = 19$

14) $3x - 2 = 16$

15) $4x + 3 = 23$

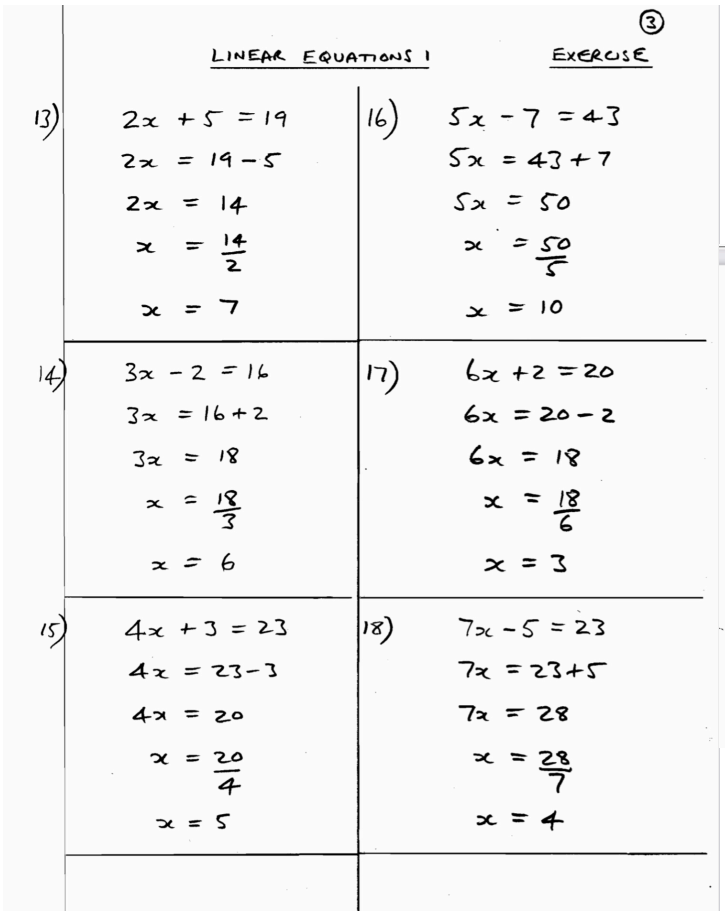
16) $5x - 7 = 43$

17) $6x + 2 = 20$

18) $7x - 5 = 23$

19) $2x - 7 = 8$

20) $3x + 5 = 19$



③

LINEAR EQUATIONS I — EXERCISE

13) $2x + 5 = 19$
$2x = 19 - 5$
$2x = 14$
$x = \frac{14}{2}$
$x = 7$

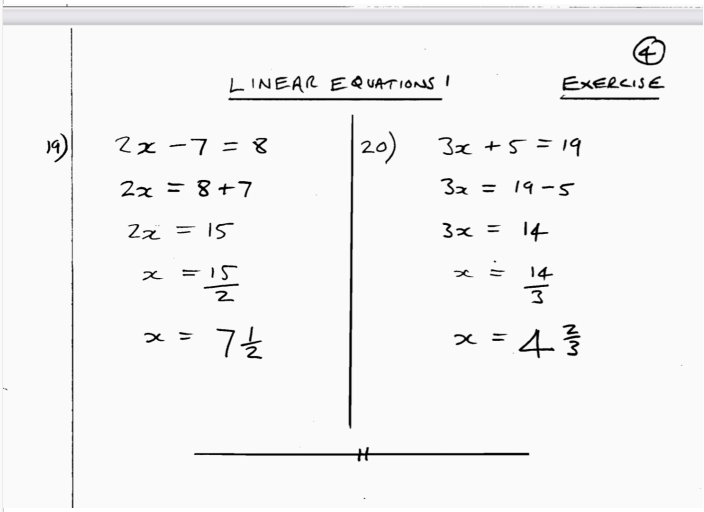
16) $5x - 7 = 43$
$5x = 43 + 7$
$5x = 50$
$x = \frac{50}{5}$
$x = 10$

14) $3x - 2 = 16$
$3x = 16 + 2$
$3x = 18$
$x = \frac{18}{3}$
$x = 6$

17) $6x + 2 = 20$
$6x = 20 - 2$
$6x = 18$
$x = \frac{18}{6}$
$x = 3$

15) $4x + 3 = 23$
$4x = 23 - 3$
$4x = 20$
$x = \frac{20}{4}$
$x = 5$

18) $7x - 5 = 23$
$7x = 23 + 5$
$7x = 28$
$x = \frac{28}{7}$
$x = 4$



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LINEAR EQUATIONS I — EXERCISE

19) $2x - 7 = 8$
$2x = 8 + 7$
$2x = 15$
$x = \frac{15}{2}$
$x = 7\frac{1}{2}$

20) $3x + 5 = 19$
$3x = 19 - 5$
$3x = 14$
$x = \frac{14}{3}$
$x = 4\frac{2}{3}$

Eqns with an x term on both sides

Ex 7 $8x + 3 = 5x + 15$

$8x - 5x = 15 - 3$

$3x = 12$

$x = \frac{12}{3}$

$x = 4$

Ex 8

$$5x - 14 = 28 - 5x$$

$$5x + 5x = 28 + 14$$

$$10x = 42$$

$$x = \frac{42}{10}$$

$$x = 4.2$$

Ex 9

$$-9x + 32 = x - 11$$

$$-9x - x = -11 - 32$$

$$-10x = -43$$

$$x = \frac{-43}{-10}$$

$$x = 4.3$$

Equations involving brackets

Ex 10

$$3(2x - 5) = 9$$

$$6x - 15 = 9$$

$$6x = 9 + 15$$

$$6x = 24$$

$$x = \frac{24}{6}$$

$$x = 4$$

Ex 11

$$2(5x - 1) = 28$$

$$10x - 2 = 28$$

$$10x = 28 + 2$$

$$10x = 30$$

$$x = \frac{30}{10}$$

$$x = 3$$

Exercise

3. $8x - 2 = 4x + 10$

4. $3x + 7 = 27 - x$

5. $9x - 3 = 7x + 8$

6. $2x - 5 = 16 - 5x$

7. $2(x + 3) = 18$

8. $4(x - 5) = 8$

9. $3(2x + 7) = 30$

10. $5(2x - 3) = 25$

LINEAR EQUATIONS (2) — EXERCISE

1. $3x - 7 = 23$
$3x = 23 + 7$
$3x = 30$
$x = \frac{30}{3}$
$x = 10$

2. $5x + 3 = 25$
$5x = 25 - 3$
$5x = 22$
$x = \frac{22}{5}$
$x = 4\frac{2}{5}$

3. $8x - 2 = 4x + 10$
$8x - 4x = +10 + 2$
$4x = 12$
$x = \frac{12}{4}$
$x = 3$

4. $3x + 7 = 27 - x$
$3x + x = 27 - 7$
$4x = 20$
$x = \frac{20}{4}$
$x = 5$

5. $9x - 3 = 7x + 8$
$9x - 7x = 8 + 3$
$2x = 11$
$x = \frac{11}{2}$
$x = 5\frac{1}{2}$

6. $2x - 5 = 16 - 5x$
$2x + 5x = 16 + 5$
$7x = 21$
$x = \frac{21}{7}$
$x = 3$

LINEAR EQUATIONS (2) — EXERCISE

7. $2(x + 3) = 18$
$2x + 6 = 18$
$2x = 18 - 6$
$2x = 12$
$x = \frac{12}{2}$
$x = 6$

8. $4(x - 5) = 8$
$4x - 20 = 8$
$4x = 8 + 20$
$4x = 28$
$x = \frac{28}{4}$
$x = 7$

9. $3(2x + 7) = 30$
$6x + 21 = 30$
$6x = 30 - 21$
$6x = 9$
$x = \frac{9}{6}$
$x = 1\frac{3}{6}$ or $x = 1\frac{1}{2}$

10. $5(2x - 3) = 25$
$10x - 15 = 25$
$10x = 25 + 15$
$10x = 40$
$x = \frac{40}{10}$
$x = 4$

Word Problems

Ex1 Alan is twice as old as Bill. Colin is 5 years older than Alan. Colin 17. How old is Bill?

Let Bill be x years old

Alan will be $2x$ years old

Colin will be $2x+5$ years old

$\therefore \quad 2x+5 = 17$

$2x = 17-5$

$2x = 12$

$x = \frac{12}{2}$ $\qquad x = 6$

Bill is 6 years old

Ex 2 John's dad is currently 3 times as old as John. In 12 years time John's dad will be only twice as old as John.
How old is John now?

Let John be x years old now

Now dad is $3x$ years old

In 12 years time

John will be $x+12$

Dad will be $3x + 12$

$\therefore$ $3x + 12 = 2(x + 12)$

$3x + 12 = 2x + 24$

$3x - 2x = 24 - 12$

$x = 12$

John is 12 years old now