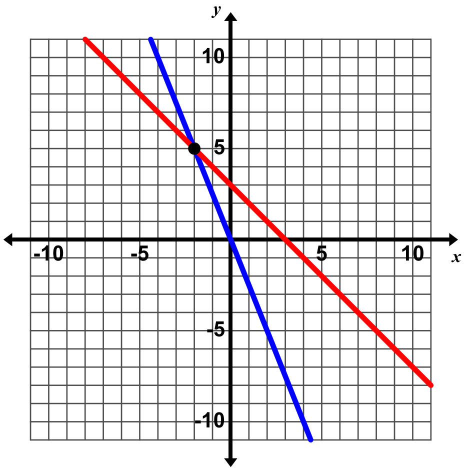
CHAPTER 1 EXAM REVIEW- Extended Solutions

(Revised Fall 2016)

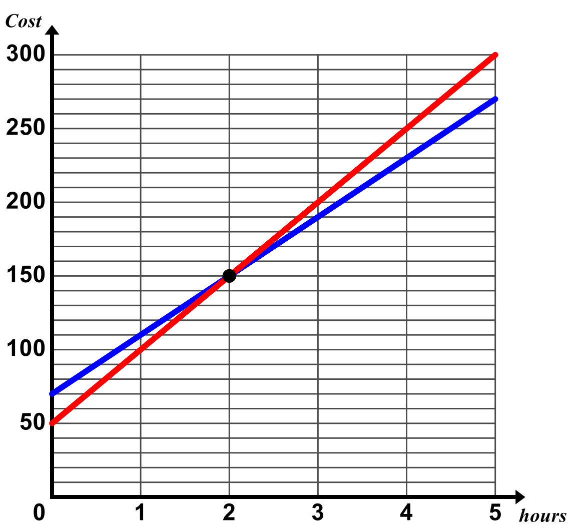
1. e
2. a
3. h
4. b
5. c
6. d
7. i
8. f

9.



The point of intersection is $(-2, 5)$.

10.



a) C = 40h + 70 (Pool BoyZ)
C = 50h + 50 (KemiKal)

b) the solution is (2, 150)

c) For two hours of labour,
the cost will be the same for both companies.

d) Pool BoyZ is cheaper for all times greater than 2 hours.

11.

Simplify both equations

(1) $2x-8+y=6$

(2) $3x-2y+6=13$

Solve (1) *for* y

(3) $y=-2x+14$

Sub (3) into (2)

$3x - 2(-2x+14)+6=13$

$3x+4x-28+6=13$

$7x=35$

$x=5$

Sub x = 5 into (3)

$y=-2(5)+14$

$y=-10+14$

$y=4$

$\therefore x=5 \;\; and \;\; y=4$

Check

$LS=2(x-4)+y \qquad RS=6$

$LS=2(5-4)+4$

$LS=2(1)+4$

$LS=6$

$LS=3x-2(y-3) \qquad RS=13$

$LS=3(5)-2(4-3)$

$LS=15-2(1)$

$LS=13$

$\because LS = RS$ *for both equations the solution* $x=5,\ y=4$ *is correct.*

12. Let x represent the amount of the 25% copper alloy used, and y represent the amount of the 50% alloy used.

$x + y = 1500$

$0.25x + 0.5y = (0.4)(1500)$

Solve using substitution or elimination (elimination is shown here)

$$\begin{array}{ll} (1) & x + y = 1500 \\ (2)\times 4 & \underline{x + 2y = 2400} \\ subtract & -y = -900 \\ solve & y = 900 \end{array}$$

sub y = 900 into (1)

$x + 900 = 1500$

$x = 600$

To make 1500 g of an alloy that is 40% copper,
600 g of the 25% copper alloy and 900g of the 50% copper alloy should be used.

13. Let x litres represent the number of litres of the 25% acidic solution to use,
and y represent the number of litres of the 50% acidic solution to use.

$x + y = 500$

$0.25x + 0.5y = (0.35)500$

Solve using substitution or elimination (substitution is shown here)

Solve (1) for y

(3) $y = 500 - x$

Sub (3) into (2)

$$\begin{aligned} 0.25x + 0.5(500 - x) &= 175 \\ 0.25x + 250 - 0.5x &= 175 \\ -0.25x &= -75 \\ x &= 300 \end{aligned}$$

sub x = 300 into (3)

$y = 500 - 300$

$y = 200$

To make the 35% acidic solution, Chris should mix 300 L of the 25% solution and 200 L of the 50% solution.

14. Let the speed of the houseboat in still water (no current) be *h*, and the speed of the river's current be *c*, both in kilometres per hour.

Upstream: $48 = (h - c) \times 6$

Downstream: $48 = (h + c) \times 4$

$8 = h - c \quad (divided\ both\ sides\ by\ 6)$

$12 = h + c \quad (divided\ both\ sides\ by\ 4)$

Solve by elimination

$$\begin{array}{rr} & 8 = h - c \\ & \underline{12 = h + c} \\ add & 20 = 2h \\ & 10 = h \end{array}$$

sub $h = 10$ into $8 = h - c$

$8 = 10 - c$

$-2 = -c$

$2 = c$

The houseboat travelled at 10 km/h in still water, and the river current was 2 km/h.

15. Let *f* be the speed of the fishing boat in still water, and *c* be the speed of the river's current.

Upstream: $72 = (f - c) \times 4$

Downstream: $72 = (f + c) \times 3$

$18 = f - c \quad (divided\ both\ sides\ by\ 4)$

$24 = f + c \quad (divided\ both\ sides\ by\ 3)$

Solve by elimination

$$\begin{array}{rr} & 18 = f - c \\ & \underline{24 = f + c} \\ add & 42 = 2f \\ & 21 = f \end{array}$$

sub f = 21 into 18 = f − c

$18 = 21 - c$

$-3 = -c$

$3 = c$

The fishing boat's speed in still water was 21 km/h, and the river's current was 3 km/h.