

Name: Solutions

- Instructions: 1. Scientific, non-programmable, non-graphic calculators may be used on Part D only.
2. Show complete solutions in the space provided, unless otherwise specified.
3. Express all answers in simplest form.
4. Marks will be deducted for bad form.

PART A: Give complete, well-organized solutions. Place your final answer on the line provided. No calculators are allowed.

[2] 1. Evaluate: $-2^2 - (-8) + (-12)$

$$= -4 + 8 - 12$$

$$= -16 + 8$$

$$= -8$$

-8

[3] 2. Evaluate $\frac{-3}{-10} + \frac{2}{3} \div \left(-\frac{5}{6}\right)$

$$= \frac{3}{10} + \left[\frac{2}{3} \times \left(-\frac{6}{5}\right)\right]$$

$$= \frac{3}{10} + \left[-\frac{4}{5}\right]$$

$$= \frac{3}{10} - \frac{8}{10}$$

$$= -\frac{5}{10}$$

$$= -\frac{1}{2}$$

$-\frac{1}{2}$

[2] 3. Simplify $\frac{(-2x^2y^5)^3}{2x^2y^6}$

$$= \frac{(-2)^3 x^6 y^{15}}{2x^2y^6}$$

$$= \frac{-8x^6y^{15}}{2x^2y^6}$$

$$= -4x^4y^9$$

$-4x^4y^9$

[3] 4. Express $\frac{(10^5 \times 10^2)^6}{10^{-35} \times 10^{22}}$ as a single power.

$$= \frac{(10^7)^6}{10^{-13}}$$

$$= \frac{10^{42}}{10^{-13}}$$

$$= 10^{55}$$

10^{55}

[2] 5. Expand and simplify $-3x(x+4) - 5(x^2 - 6x)$.

$$= -3x^2 - 12x - 5x^2 + 30x$$

$$= -8x^2 + 18x$$

$-8x^2 + 18x$

[3] 6. Simplify $7x^2 - [4x^2 - 3x(x+6)]$

$$= 7x^2 - [4x^2 - 3x^2 - 18x]$$

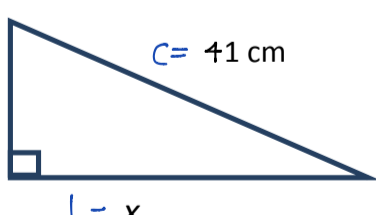
$$= 7x^2 - [x^2 - 18x]$$

$$= 7x^2 - x^2 + 18x$$

$$= 6x^2 + 18x$$

$6x^2 + 18x$

[2] 7. Determine the value of x.



$a = 9$ cm, $C = 41$ cm, $b = x$

$$c^2 = a^2 + b^2$$

$$41^2 = 9^2 + x^2$$

$$1681 = 81 + x^2$$

$$1681 - 81 = x^2$$

$$1600 = x^2$$

$$\sqrt{1600} = x$$

$$\therefore x = 40 \text{ cm}$$

$$\begin{array}{r} 41 \\ \times 41 \\ \hline 1640 \\ 1681 \\ \hline \end{array}$$

$x = 40$ cm

[1] 8. Write the equation of the line $x + 5y + 20 = 0$ in $y = mx + b$ form.

$$\frac{5y}{5} = -\frac{x}{5} - \frac{20}{5}$$

$$y = -\frac{1}{5}x - 4$$

$y = -\frac{1}{5}x - 4$

[1] 9. Write the equation for the line with undefined slope passing through the point $(-7, 4)$.

vertical
line
 $\therefore x = -7$

$x = -7$

[7] 10. Determine the equations of the following lines in slope, y-intercept form.

a) The equation of the line passing through the following points: (2, 4) and (-6, 10).

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 4}{-6 - 2} = \frac{6}{-8} = -\frac{3}{4}$$

$$m = -\frac{3}{4}; (x, y) = (2, 4); b = ?$$

$$y = mx + b$$

$$4 = -\frac{3}{4}(2) + b \rightarrow b = \frac{11}{2}$$

$$4 = -\frac{3}{2} + b$$

$$\frac{8}{2} + \frac{3}{2} = b$$

\therefore the equation of the line is $y = -\frac{3}{4}x + \frac{11}{2}$

b) The equation of the line perpendicular to $2x - y = 4$ with the same y-intercept as $\frac{2}{3}x + \frac{3}{4}y + 6 = 0$.

① Find m:

$$2x - y = 4$$

$$-y = -2x + 4$$

$$y = 2x - 4$$

$$m = \frac{2}{1}$$

$$\therefore m_{\perp} = -\frac{1}{2}$$

② Find y-int:

$$\text{Let } x = 0$$

$$\frac{2}{3}(0) + \frac{3}{4}y + 6 = 0$$

$$\frac{3}{4}y = -6$$

$$3y = -24$$

$$y = -8$$

$$m = -\frac{1}{2}; b = -8$$

$$y = mx + b$$

\therefore the equation is $y = -\frac{1}{2}x - 8$

[9] 11. Graph the following lines on the grid below by the indicated method. Label each line appropriately.

a) $y = -\frac{2}{5}x + 2$ using the slope, y-intercept method. State the slope and y-intercept. Slope = $-\frac{2}{5}$; y-int = 2

c) $x + 10 = 0$ using the method of your choice.

$x = -10$ (vertical line)

b) $4x - 3y - 12 = 0$ using the x- and y-intercept method. Show your work.

① Find x-int:

$$\text{Let } y = 0$$

$$4x - 3(0) - 12 = 0$$

$$4x = 12$$

$$x = 3$$

\therefore Plot: (3, 0)

② Find y-int:

$$\text{Let } x = 0$$

$$4(0) - 3y - 12 = 0$$

$$-3y = 12$$

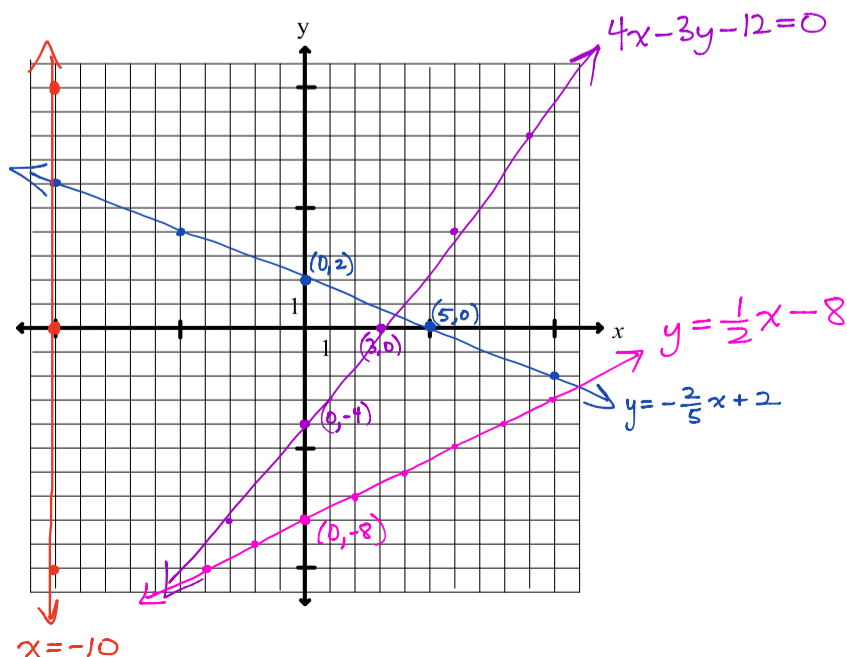
$$y = -4$$

\therefore Plot: (0, -4)

d) $y = \frac{1}{2}x - 8$ using the table of values method. Show your work.

Multiplies of 2

x	y	= $\frac{1}{2}x - 8$
-4	-10	= $\frac{1}{2}(-4) - 8$
-2	-9	= $\frac{1}{2}(-2) - 8$
0	-8	= $\frac{1}{2}(0) - 8$
2	-7	= $\frac{1}{2}(2) - 8$
4	-6	= $\frac{1}{2}(4) - 8$



- [10] 12. The total cost for T-shirts at Team Tops is made up of a \$75 set-up fee and a charge of \$5 for each T-shirt. Super Shirts has no set-up fee but charges twice as much for each T-shirt as Team Tops. ← \$10/shirt

- a) Write two equations that represent the cost of buying T-shirts from each company. Include "let" statements.

Let x represent the number of t-shirts.
Let y represent the total cost, in \$.

$$\textcircled{1} y = 5x + 75$$

$$\textcircled{2} y = 10x$$

- b) Graph each equation on the grid provided using a table of values.

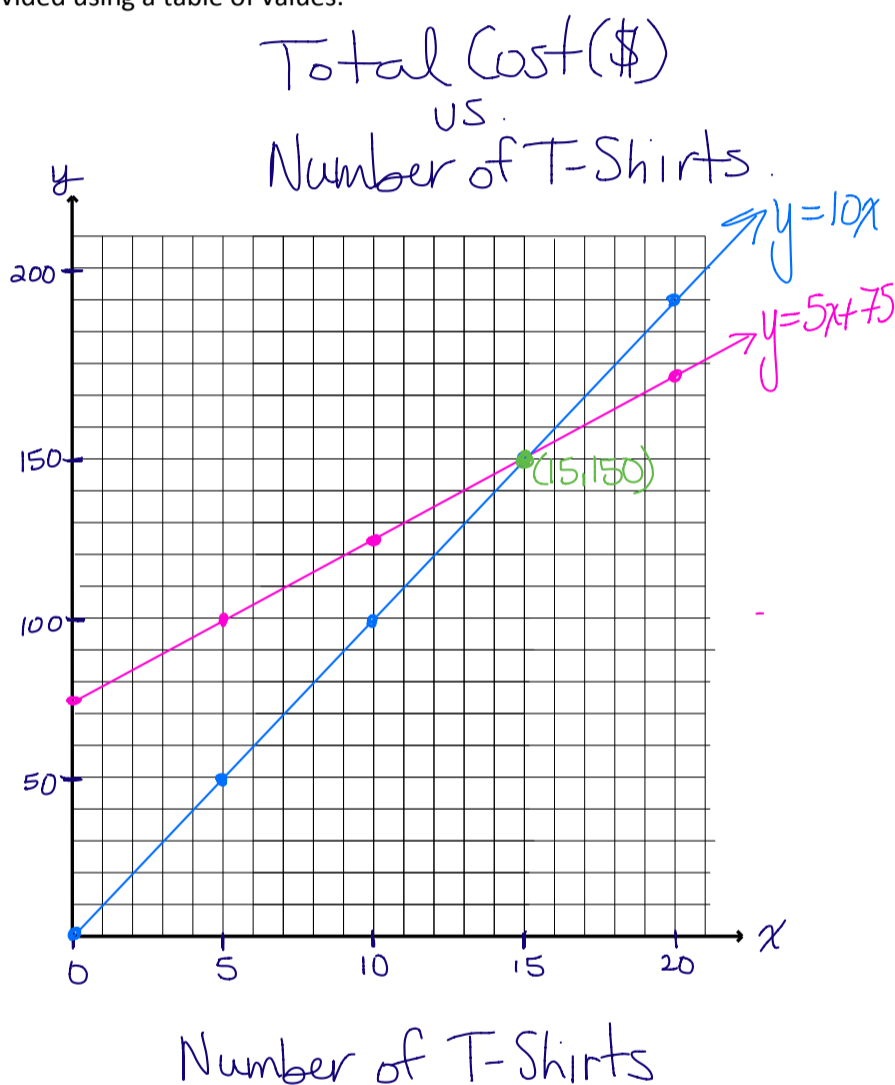
$$\textcircled{1} y = 5x + 75$$

x	y
0	75
5	100
10	125
15	150
20	175

$$\textcircled{2}$$

x	y
0	0
5	50
10	100
15	150
20	200

Total Cost (\$)



- c) State the point of intersection and explain its specific meaning in this situation.

The point of intersection is (15, 150).

This means that if 15 shirts are sold it will cost the same amount of \$150 at both companies.