# Dublin Algebra One Semester One Exam Review Packet 2014

**MODULE 1** **Quantitative Reasoning**

1. Solve $-8 = \frac{x}{2}$ for $x$.

$2(-8) = \frac{x}{2}(2)$

$\boxed{-16 = x}$

2. Tonya is saving money to buy a computer that costs $375. She has $75 saved, and each week she adds $25 to her savings. How many weeks will it take her to save enough money to buy the computer?

let $w$ = # of weeks it will take to save enough money to buy computer

$25w + 75 = 375$

$-75 \quad -75$

$25w = 300$

$\frac{25w}{25} = \frac{300}{25}$

$w = 12$

$\boxed{\text{12 weeks to save for computer}}$

3. $\frac{24}{5z+4} = \frac{4}{z-1}$

$4(5z+4) = 24(z-1)$

$20z + 16 = 24z - 24$

$-20z \quad -20z$

$16 = 4z - 24$

$+24 \quad +24$

$\frac{40}{4} = \frac{4z}{4}$

$\boxed{10 = z}$

4. What is the solution for the equation $-3.2 = 2.5 + 1.2m$?

$-2.5 \quad -2.5$

$-5.7 = 1.2m$

$\frac{-5.7}{1.2} = \frac{1.2m}{1.2}$

$\boxed{-4.75 = m}$

5. $\frac{k-8}{7+k} = \frac{-1}{5}$

$-1(7+k) = 5(k-8)$

$-7 - k = 5k - 40$

$+k \quad +k$

$-7 = 6k - 40$

$+40 \quad +40$

$\frac{33}{6} = \frac{6k}{6}$

$\boxed{5.5 = k}$

6. A building that is 15 meters tall casts a shadow that is 6 meters long. At the same time, a tree casts a shadow that is 9 meters long. How tall is the tree?

| 15 ft | building | x | tree |
|---|---|---|---|
| 6 ft | | 9 ft | |

let $x$ = height of tree

$\frac{15}{6} = \frac{x}{9}$

$15(9) = 6x$

$\frac{135}{6} = \frac{6x}{6}$

$22.5 = x$

$\boxed{\text{The tree is } 22\frac{1}{2} \text{ feet tall.}}$

# Dublin Algebra One Semester One Exam Review Packet 2014

7. A bottle can hold 2.75 liters of water. About how many gallons can the bottle hold? Round to the nearest hundredth. (Hint: 1 liter ≈ 0.26 gallons.)

$2.75 \text{ liters} \cdot \frac{.26 \text{ gallons}}{1 \text{ liter}} = .715 \text{ gallons}$

**.72 gallons**

8. A train travels 125.5 miles in 150 minutes. One mile is about 1.61 kilometers. Which of the following is closest to the train's speed in kilometers per hour?

A 31.2 $\frac{km}{h}$

B 78.0 $\frac{km}{h}$

C 80.8 $\frac{km}{h}$

D 202 $\frac{km}{h}$

$\frac{125.5 \text{m}}{150 \text{m}} \cdot \frac{1.61 \text{km}}{1 \text{mile}} \cdot \frac{60 \text{min}}{1 \text{hour}} =$

$\frac{12123.3}{150}$

80.822 Km/hr

**C**

9. Which of the following is the most precise measurement?

A 13 in.

B 13.6 in.

**C 13.615 in.**

D 13.62 in.

11. Solve $2.5 = \frac{x}{6}$.

$6(2.5) = \frac{x}{6} \cdot 6$

$15 = x$

12. Solve the equation $(-4)^2 = \left(\frac{12p+10}{2}\right)^2$

$-8 = 12p + 10$

$-10 \quad -10$

$\frac{-18}{12} = \frac{12p}{12}$

$-1.5 = p$

13. Dante's cell phone company charges $45 per month for unlimited calls and internet use and $0.25 per text message. His last cell phone bill was $60.50. How many text messages did Dante send last month?

Let $x$ = # of text messages

$60.50 = .25x + 45$

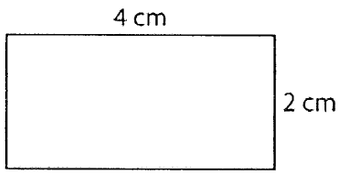
$-45 \quad -45$

$\frac{15.50}{.25} = \frac{.25x}{.25}$

$62 = x$

**62 text messages**

14. Thomas is building a fence around his garden. He made a scale drawing as shown below.




Scale
1 cm: 1.5 m

What is the perimeter of the actual fence?

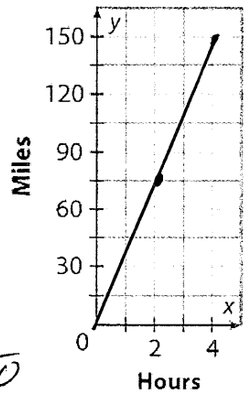
Perimeter of scale drawing = 12cm

$\frac{12 \text{cm}}{1 \text{cm}} \cdot \frac{1.5 \text{m}}{} = 18 \text{ meters}$

**Perimeter of actual fence = 18 meters**

# Dublin Algebra One Semester One Exam Review Packet 2014

15. Mr. Swanson drove 150 miles in 4 hours at a constant speed. Plot the points on the graph to represent the total distance he drove each hour.




| Hours | Miles |
|---|---|
| 0 | 0 |
| 1 | $37\frac{1}{2}$ |
| 2 | 75 |
| 3 | 112.50 |
| 4 | 150 |

16. $\frac{1}{8}(5y + 64) = \frac{1}{4}(20 + 2y)$

$\frac{5}{8}y + 8 = 5 + \frac{1}{2}y$

$-\frac{1}{2}y \qquad -\frac{1}{2}y$

$\frac{3}{8}y + 8 = 5$

$-8 \qquad -8$

$\left(\frac{8}{3}\right)\frac{3}{8}y = -3\left(\frac{8}{3}\right)$

$y = -8$

17. $14 - \frac{1}{5}(x - 10) = \frac{2}{5}(25 + x)$

$14 - \frac{1}{5}x + 2 = 10 + \frac{2}{5}x$

$16 - \frac{1}{5}x + \frac{1}{5}x = 10 + \frac{2}{5}x + \frac{1}{5}x$

$16 = 10 + \frac{3}{5}x$

$-10 \qquad -10$

$\left(\frac{5}{3}\right)6 = \frac{3}{5}x\left(\frac{5}{3}\right)$

$10 = x$

18. $-2(3x - 3) = 6(5 - 2x)$

$-6x + 6 = 30 - 12x$

$+12x \qquad +12x$

$6x + 6 = 30$

$-6 \qquad -6$

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

$x = 4$

19. $3x - 4 = 2x + 8 - 5x$

$3x - 4 = -3x + 8$

$+3x \qquad +3x$

$6x - 4 = 8$

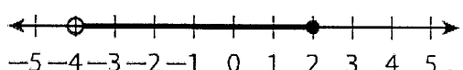
$+4 \qquad +4$

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

$x = 2$

## MODULE 2 Algebraic Models

1. Write the solution of the compound inequality graphed below.




$-4 < x$ and $x \leq 2$

$-4 < x \leq 2$

2. How many coefficients are in the expression $\frac{1}{3}y^2 - 18y + 9 - 2y^{-2}$?

3

$\frac{1}{3}$, $-18$, $-2$

# Dublin Algebra One Semester One Exam Review Packet 2014

3. Is each of the following a term of the expression $-9x^3 + 12p + 6$?

| | | |
|---|---|---|
| A $p$ | ○ Yes | ⊗ No |
| B $-9x^3$ | ⊗ Yes | ○ No |
| C 3 | ○ Yes | ⊗ No |
| D 6 | ⊗ Yes | ○ No |

4. Kurt works at a cafe and earns \$16 per hour. On Wednesday, he worked $t$ hours, and his neighbor paid him \$5 per hour to babysit for $b$ hours. Which expression best represents the amount Kurt earned on Wednesday?

A $16t + 5$

B $16t - 5b$

C $16t + 5b$

D $16b + 5t$

5. Is each of the following equivalent to $6(2y - 4) + p$? $= 12y - 24 + p$

| | | |
|---|---|---|
| A $p + 12y - 24$ | ⊗ Yes | ○ No |
| B $6y + p - 24$ | ○ Yes | ⊗ No |
| C $p - 6(4 - 2y)$ | ⊗ Yes | ○ No |
| D $24 + 12y + p$ | ○ Yes | ⊗ No |

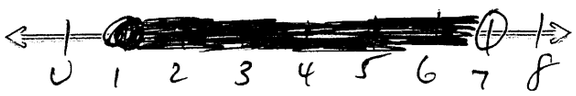
6. Les bought 6 pairs of shorts for $s$ dollars each and a blazer that cost three times as much as a pair of shorts. He spent a total of \$139.50. How much did the blazer cost?

Let $b$ = blazer (cost of)
Let $s$ = shorts (cost of)
$b = 3s$
$6s + 1b = 139.50$
$6s + 3s = 139.50$
$9s = 139.50$
$s = \$15.50$
$b = \$46.50$

7. Solve and graph the compound inequality.

$-6 \leq 3x - 9 < 12$

$-6 \leq 3x - 9$ and $3x - 9 < 12$
$3 \leq 3x$ $\quad$ $3x < 21$
$1 \leq x$ $\quad$ $x < 7$




8. The equation for finding the area of a trapezoid is $A = \frac{1}{2}(b_1 + b_2)h$. What is the equation solved for $h$?

A $h = \frac{A}{b_1 + b_2}$

B $h = \frac{2A}{b_1 + b_2}$

C $h = \frac{1}{2}(b_1 + b_2)$

D $h = 2A - b_1 - b_2$

9. Marcus is buying 10 gift bags for his birthday party. He will choose items to put in the bags and then pay an additional charge of \$0.75 for the actual bag. Marcus cannot spend more than \$50. Write and solve an inequality to find the most Marcus can spend on the items for each bag.

Let $x$ = cost of item for gift bag
$10(x + .75) \leq 50$
$10x + 7.5 \leq 50$
$10x \leq 42.5$
$x \leq \$4.25$
Marcus must spend \$4.25 or less

# Dublin Algebra One Semester One Exam Review Packet 2014

10. Choose True or False for each statement about the solutions of $\frac{x}{4}+6\frac{1}{4}>7\frac{1}{2}$.

$4\left(\frac{x}{4}+6\frac{1}{4}\right)>\left(7\frac{1}{2}\right)4$

$x+25>30$

$x>5$

A The solutions are all less than 5.
○ True ⊗ False

B The solutions are all greater than 5.
⊗ True ○ False

C The solution set includes –6.
○ True ⊗ False

D The solution set includes 12.
⊗ True ○ False

11. Stanley ran a 5 kilometer race in 30 minutes. What was his speed in kilometers per hour? Round to the nearest tenth.

$\frac{5\text{ km}}{30\text{ min}}\cdot\frac{60\text{ min}}{1\text{ hour}}=\frac{10\text{ km}}{1\text{ hr}}$

12. Write the coefficient(s) in the expression $7x^2-y+9$.

7, −1

13. Suppose $x$ and $y$ are the number of students in two classrooms, where $x<y$. Compare the expressions using <, =, or >.

$(2x)^2 \boxed{<} (x+y)^2$ Must be positive

$2x<x+y$

14. Monday, Nita earned \$85 for $h$ hours of babysitting. On Wednesday, she earned the same rate for 8 hours of babysitting and got a \$12 tip. Write an expression to represent how much Nita earned on Wednesday.

Monday: $\frac{\$85}{h}$

Wednesday: $8\left(\frac{85}{h}\right)+12$

15. A cell phone company charges \$45 per month for unlimited calls and \$0.25 per text message. Another cell phone company charges \$0.15 per text message and \$70 per month for unlimited calls.

a. Write an equation to represent the number of text messages sent in a month that would make each plan cost the same amount.

b. Solve the equation and interpret the solution.

Let $x$ = # of text messages

$.25x+45=.15x+70$

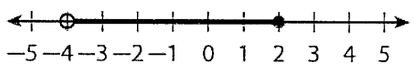
$.10x=25$

$x=250$

250 text messages would be same cost. Less than 250, the first company cheaper. More than 250, the second company cheaper

Write the solution of the compound inequality graphed below.

16.




$-4<x$ AND $x\le 2$

$-4<x\le 2$

17. Solve the inequality $8-d\ge -3d+4$.

$+3d \quad +3d$

$8+2d\ge 4$

$-8 \quad -8$

$\frac{2d}{2}\ge\frac{-4}{2}$

$d\ge -2$

18. Solve the inequality $2(3x-4)\ge 9x-10$.

$6x-8\ge 9x-10$

$-6x \quad -6x$

$-8\ge 3x-10$

$+10 \quad +10$

$\frac{2}{3}\ge\frac{3x}{3}$

$\frac{2}{3}\ge x$