

Math 9 Final Exam Prep

$$(3y^2 - 7x^2 + 5) - (3x - 9 + 5y^2)$$

$$3y^2 - 7x^2 + 5 - 3x + 9 - 5y^2$$

$$3y^2 - 5y^2 - 7x^2 - 3x + 5 + 9$$

$$-2y^2 - 7x^2 - 3x + 14$$

Multiple Choice

Identify the choice that best completes the statement or answers the question.

C 1. Subtract: $(3y^2 - 7x^2 + 5) - (3x - 9 + 5y^2)$

- a. $3y^2 - 10x^2 + 14$ c. $-2y^2 - 7x^2 - 3x + 14$
 b. $-7x + 14$ d. $-2y^2 - 7x^2 - 3x - 4$

C 2. Evaluate: $(-10^5)^0$

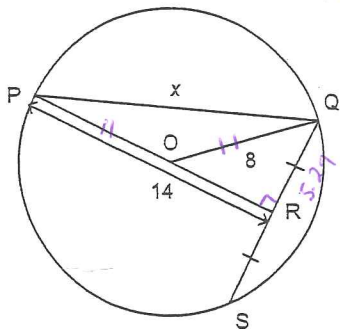
- a. -50 b. 50 c. 1 d. -1

D 3. Determine this difference.

$$\frac{6}{5} - \frac{1}{4} = \frac{24}{20} - \frac{5}{20} = \frac{19}{20}$$

- a. $\frac{19}{20}$ b. $\frac{29}{20}$ c. $\frac{19}{20}$ d. $\frac{29}{20}$

- A 4. O is the centre of the circle. Determine the value of x to the nearest tenth, if necessary.



To find OR: $14 - 8 = 6$
 $OR^2 + QR^2 = OQ^2$
 $6^2 + QR^2 = 8^2$
 $36 + QR^2 = 64$
 $QR^2 = 28$
 $QR = 5.29$

$$PR^2 + QR^2 = x^2$$

$$14^2 + 28 = x^2$$

$$196 + 28 = x^2$$

$$224 = x^2$$

$$x = 14.96 = 15$$

- a. 15 b. 5.3 c. 224 d. 17.2

D 5. Evaluate: $10^2 \times 10^5 + 10^4$

- a. 100 000 000 000 c. 110
 b. 10 000 010 000 d. 10 010 000

$$10^{2+5} + 10^4$$

$$\rightarrow 10000000 + 10000$$

$$\underline{\hspace{1cm}}$$

$$10010000$$

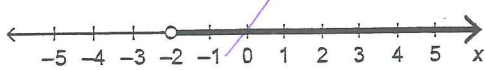
B 6. Which expression has a value of 0?

- i) $-(-7)^0 + 2 \times (-5)^0 - (-4)^0 = -1 + 2 \times 1 - 1 = 0$
 ii) $(7 \times 5)^0 - (5 - 4)^2 + (8 - 5)^0 = 1 - 1 + 1 = 1$
 iii) $5 - (4 \div 4)^2 - (-8)^0 = 5 - 1 - 1 = 3$
 iv) $(4 \times 4 \div 8) - (5^2 - 7^2)^0 - (-7)^0 = 2 - 1 - 1 = 0$

- a. ii and iii b. i and iv c. i, iii, and iv d. i, ii, and iv

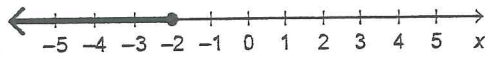
C 7. Which of these graphs represent the solution of the inequality $4x \geq -8$?

i)

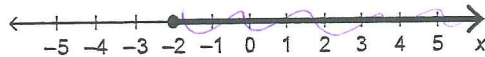


$\frac{4x}{4} \geq \frac{-8}{4}$
 $x \geq -2$

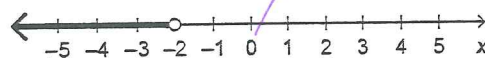
ii)



iii)



iv)



- a. Graph i b. Graph ii c. Graph iii d. Graph iv

B 8. Evaluate: -9^0

- a. 9 b. -1 c. 0 d. 1

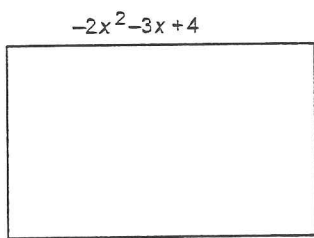
A 9. Solve: $9 - 5x = 2x - 12$

- a. $x = 3$ b. $x = \frac{1}{3}$ c. $x = -3$ d. $x = -\frac{1}{3}$

A 10. Solve: $\frac{x}{4} + \frac{7}{2} = \frac{11}{4}$

- a. $x = -3$ b. $x = 4$ c. $x = 8$ d. $x = -12$

B 11. Determine the area of this rectangle.



$8(-2x^2 - 3x + 4)$
 $-16x^2 - 24x + 32$

- a. $16x^2 - 3x + 4$ c. $-10x^2 - 3x + 4$
b. $-16x^2 - 24x + 32$ d. $-10x^2 - 11x - 4$

A 12. Which power is positive?

- i) $(7)^5$ ✓ ii) $(-7)^5$ ✗ iii) $-(7)^5$ ✗ iv) $-(-7)^5$ ✓
a. i and iv b. i, ii, and iv c. i and ii d. iii and iv

B 13. Add: $(5x^2 - 2x) + (-4 - 2x^2)$

- a. $5x^2 + 2x - 2x$ c. $3x^2 - 2x + 4$
b. $3x^2 - 2x - 4$ d. $3x^2 - 5x - 4$

C 14. Determine this quotient.

$$\frac{5}{2} \div \left(\frac{6}{5}\right) \quad \frac{5}{2} \times \frac{5}{6} = \frac{25}{12}$$

- a. 3 b. $\frac{1}{3}$ c. $\frac{25}{12}$ d. $\frac{12}{25}$

D 15. Multiply: $8(3x^2 - 2x)$

$$24x^2 - 16x$$

- a. $24x^2 - 2x$ b. $11x^2 - 6x$ c. $24x^2 + 6x$ d. $24x^2 - 16x$

A 16. Evaluate: $(5+6)^2 - (2-4)^3$

$$11^2 - (-2)^3 = 121 + (+8) = 129$$

- a. 129 b. 113 c. 5 d. 28

A 17. Determine this product.

$$\left(-\frac{5}{6}\right)\left(-\frac{3}{4}\right) \quad \frac{15}{24} = \frac{5}{8}$$

- a. $\frac{5}{8}$ b. $\frac{19}{12}$ c. $-\frac{19}{12}$ d. $-\frac{5}{8}$

A 18. Solve: $7 + \frac{3}{4}x < 19$

$$\frac{3}{4}x < 12$$

$$\frac{3x < 48}{3} \quad x < 16$$

- a. $x < 16$ b. $x > -16$ c. $x > 16$ d. $x < -16$

A 19. Evaluate.

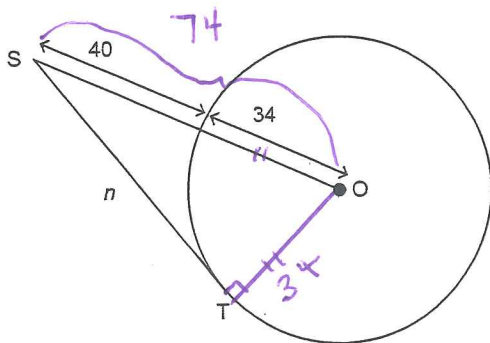
$$\frac{5}{6} - \left(\frac{3}{4} \times \frac{4}{5}\right) + \frac{5}{6}$$

$$\frac{5}{6} - \left(\frac{3}{5}\right) + \frac{5}{6} = \frac{25}{30} - \left(\frac{18}{30}\right) + \frac{25}{30} = \frac{32}{30} = \frac{16}{15}$$

- a. $\frac{16}{15}$ b. $\frac{7}{9}$ c. $-\frac{1}{360}$ d. -9

B 20. O is the centre of this circle and point T is a point of tangency.

Determine the value of n . If necessary, give your answer to the nearest tenth.



$$\begin{aligned} a^2 + b^2 &= c^2 \\ n^2 + 34^2 &= 74^2 \\ n^2 + 1156 &= 5476 \\ n^2 &= 4320 \\ n &= \sqrt{4320} \\ n &= 65.7 \end{aligned}$$

- a. 6.4 b. 65.7 c. 81.4 d. 40

D 21. Solve: $3 + x \leq 6$

- a. $x \leq 2$ b. $x \geq 3$ c. $x \leq -3$ d. $x \leq 3$

$$\begin{aligned} 3 + x &\leq 6 \\ -3 &\quad -3 \\ \hline x &\leq 3 \end{aligned}$$

$P: 9 = 14 - 5(1) \quad Q: 18 = 14 - 5(2) \quad R: 14 - 5(2) = 4 \quad S: 9 = 14 - 5(0)$
 $9 = 9 \quad 18 = 4 \quad 4 = 14 - 10 \quad 9 = 14$
 $9 = 9 \quad 18 = 4 \quad 4 = 4 \quad 9 = 14$

ID: A

Name: _____

- A 22. Which points lie on the graph represented by the equation $y = 14 - 5x$?
 P(1, 9), Q(2, 18), R(2, 4), S(0, 9)
 a. P and R b. Q and R c. R and S d. P and Q

- A 23. A square has an area of 28.8 cm^2 . Determine the side length of the square, to the nearest millimetre.
 $a^2 = 28.8 \quad a = \sqrt{28.8} \quad a = 5.37 = 5.4$
 a. 5.4 cm b. 5 cm c. 5.37 cm d. 5.3 cm

- C 24. Evaluate: $(-2)^5 \times (-2)^4 \div (-2)^0$ $-32 \times 16 \div 1 = -512$ or $-2^{5+4-0} = -2^9 = -512$
 a. 256 b. 1 048 576 c. -512 d. 512

- D 25. Solve: $\frac{x}{6} - 2 = 5$ $\frac{x}{6} = 7 \quad x = 42$
 a. 17 b. 32 c. 1 d. 42

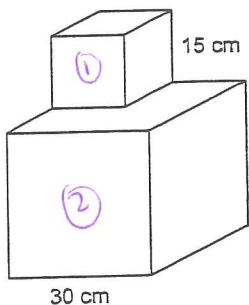
- B 26. Name the coefficients of the variable in the polynomial $-3x^2 + 7x - 9$.
 a. 3, 7 b. -3, 7 c. -3 d. -3, -9

- B 27. Which fraction is a perfect square?
 i) $\frac{9}{40}$ ii) $\frac{9}{100}$ iii) $\frac{12}{100}$ iv) $\frac{3}{10}$
 a. iii b. ii c. i d. iv

- C 28. Which expressions have positive values?
 i) $[(-6)^2]^5$ ii) $[-(-6)^2]^5$ iii) $-(6^2)^5$ iv) $-[-(-6)^2]^5$
 a. ii and iii b. i and ii c. i and iv d. ii and iv

- A 29. Which of these numbers is a solution of $y > -6$?
 i) 6 ii) -3 iii) -6 iv) -7
 a. i and ii b. iii and iv c. i and iv d. ii and iii

- D 30. This composite object is made of a 15-cm cube on top of a 30-cm cube. Determine its surface area.



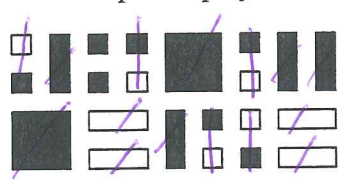
$SA = SA_1 + SA_2 - 2(OA)$
 $SA_1 = (15 \times 15) \times 6 = 1350$
 $SA_2 = (30 \times 30) \times 6 = 5400$
 $1350 + 5400 - 2(15 \times 15) =$
 $1350 + 5400 - 450 = 6300 \text{ cm}^2$

- a. 6750 cm^2 b. 5625 cm^2 c. 6525 cm^2 d. 6300 cm^2

- B 31. Name the two whole numbers whose squares are closest to $\frac{535}{10}$. $= 53.5$ $\sqrt{53.5} = 7.314$
7, 8 closest to 7.314
- a. 4, 9 b. 7, 8 c. 16, 25 d. 49, 64

- D 32. A large white square represents an x^2 -tile, a large black square represents a $-x^2$ -tile, a white rectangle represents an x -tile, a black rectangle represents a $-x$ -tile, a small white square represents a 1-tile, and a small black square represents a -1 -tile.

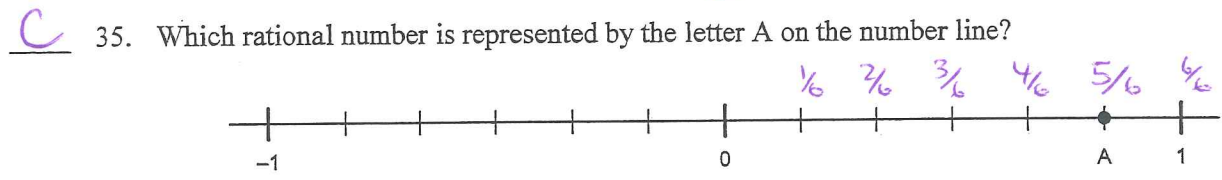
Write the simplified polynomial.



$-2x^2 - 2$

- a. $2x^2 + 2$ c. $2x^2 + x + 2$
b. $-2x^2 + x - 2$ d. $-2x^2 - 2$
- C 33. Which equations describe vertical lines?
- i.) $x + 6 = 14$ ii.) $y - 14 = 6$ iii.) $x + y = 6$ iv.) $14x = 6$
- Vert. horiz. oblique vert.
- a. ii and iii b. ii and iv c. i and iv d. i and iii

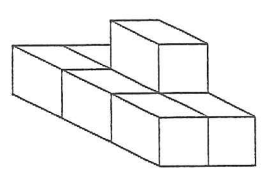
- C 34. Divide: $(12x^2 - 8x^2) \div 4x$ $\frac{12x^2}{4x} - \frac{8x^2}{4x} = 3x - 2x$
- a. $8x - 4$ b. $3x - 2$ c. $3x - 2x$ d. $3x - 8x^2$



- a. 0.8 c. $\frac{5}{6}$
b. 5 d. 0.5

- B 36. A rectangle has length 6 cm and width 4 cm. The rectangle is to be enlarged by a scale factor of 5. Calculate the length of the enlargement.
- a. 11 cm b. 30 cm c. 50 cm d. 20 cm
- $6 \times 5 = 30$

- D 37. This object is made from 7 centimetre cubes. Determine its surface area.



$7(1 \times 1 \times 6) - 2(0 \times 1)$
 $42 - 2(8)$
 $42 - 16 = 26 \text{ cm}^2$

- a. 20 cm^2 b. 28 cm^2 c. 42 cm^2 d. 26 cm^2

C 38. Which of these inequalities has -4 as a solution?

- i) $p + 1 \leq -2$ $-4 + 1 \leq -2$ ✓
- ii) $q + 2 > -2$ $-4 + 2 > -2$ ✗
- iii) $r - 1 < -4$ $-4 - 1 < -4$ ✓
- iv) $s - 4 \geq -4$ $-4 - 4 \geq -4$ ✗

- a. ii and iv
- b. i and iv
- c. i and iii
- d. i and ii

B 39. The cost to rent a piece of equipment is \$25, plus \$7.27 per hour. Calculate the cost of renting the equipment for 7 h.

- a. \$39.27
- b. \$75.89
- c. \$1272.25
- d. \$225.89

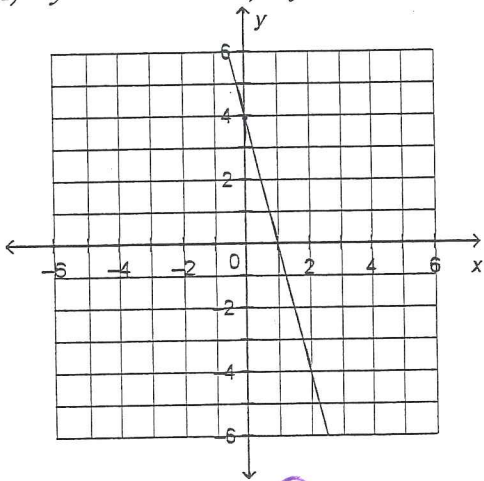
$$25 + 7.27h$$

$$25 + 7.27(7) =$$

$$25 + 50.89 = 75.89$$

B 40. Which equation describes the graph below?

- i) $y = 4x$
- ii) $y = 4x + 4$
- iii) $y = -x + 4$
- iv) $y = -4x + 4$



$$y = mx + b$$

↑ slope ↓ y-intercept

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

$$y = -4x + 4$$

- a. iii
- b. iv
- c. ii
- d. i

or you can plug points from graph $(0, 4)$ and $(1, 0)$

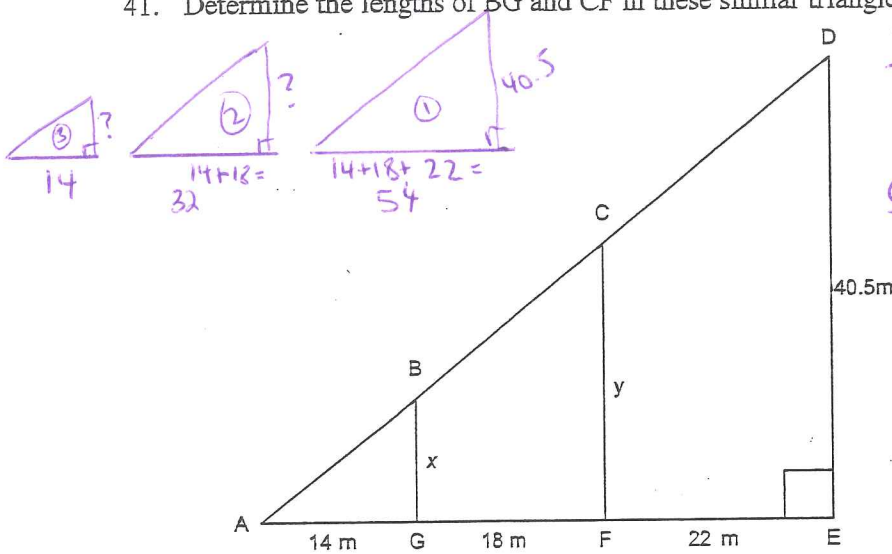
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$$SF = \frac{\text{Scale}}{\text{original}}$$

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Short Answer

41. Determine the lengths of BG and CF in these similar triangles.

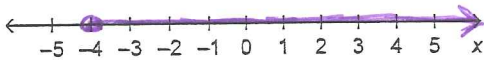


$$\underline{BG} \quad \frac{14}{54} \times 40.5 = 10.5m$$

$$\underline{CF} \quad \frac{32}{54} \times 40.5 = 24m$$

42. Solve, then graph this inequality: $x + 4 \geq 0$

$$x \geq -4$$



43. Insert $<$, $>$, or $=$ to make each expression true.

a) $1.125 \square 1\frac{1}{8}$ 1.125

b) $5\frac{2}{3} \square 5.65$

5.67

44. Evaluate: $(-4)^8 \div (-4)^7 - (-3)^3 \div (-3)^0$

$$-(-4)^{8-7} - (-3)^{3-0}$$

$$-(-4)^1 - (-3)^3$$

$$-(-4) + (+27)$$

$$= 23$$

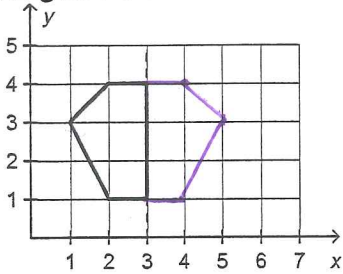
45. Order these numbers from least to greatest.

$$-\frac{5}{8}, -\frac{2}{3}, -\frac{3}{4}, -\frac{7}{12}$$

$$0.625, -0.67, -0.75, -0.7$$

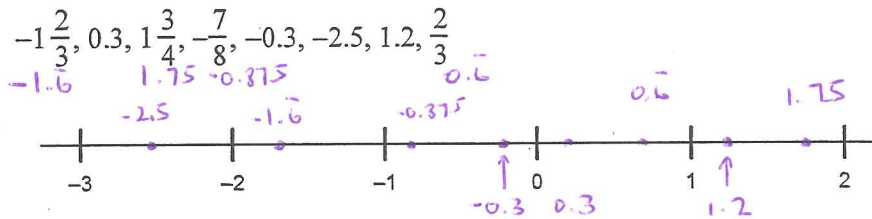
$$-\frac{3}{4}, -\frac{2}{3}, -\frac{5}{8}, -\frac{7}{12}$$

46. This polygon is one-half of a shape. Use the dotted line as a line of symmetry to complete the shape by drawing its other half.



Problem

47. a) Show these rational numbers on the number line:



b) Which number is least? -2.5

c) Which number is greatest? $1\frac{3}{4}$

48. Create a polynomial that is added to $3x^2 + 4x + 7$ to get $5x^2 + 7x + 12$. Explain how you found your answer.

To get $5x^2$, add $2x^2$

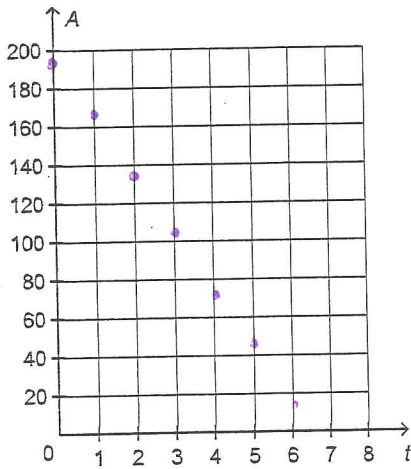
To get $7x$, add $3x$

To get 12, add 5.

So, the polynomial to add to $3x^2 + 4x + 7$ to get $5x^2 + 7x + 12$ is $\boxed{2x^2 + 3x + 5}$

49. Geoffrey has \$195 in his savings account. Each week he withdraws \$30. $A = 195 - 30t$
- Write an equation that relates the amount of money in his account, A dollars, after t weeks.
 - Create a table of values for the relation, then graph the relation. Use values of t from 0 to 6. Will you join the points on the graph? Explain.

t	0	1	2	3	4	5	6
A	195	165	135	105	75	45	15

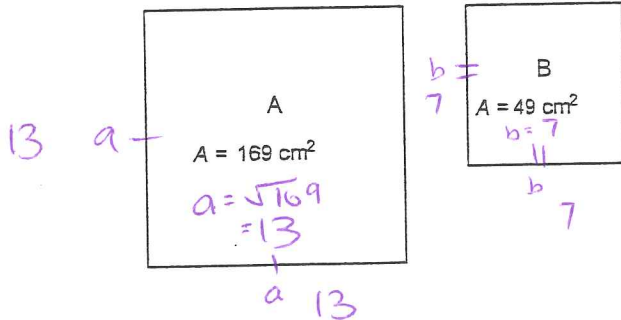


Don't join points b/c data is discrete.

- At what point will Geoffrey have \$45.00 in his account?

After 5 weeks.

50. Square B is a reduction of square A. Determine the scale factor.



$sf = \frac{\text{scale}}{\text{original}}$

$\frac{7 \text{ cm}}{13 \text{ cm}}$

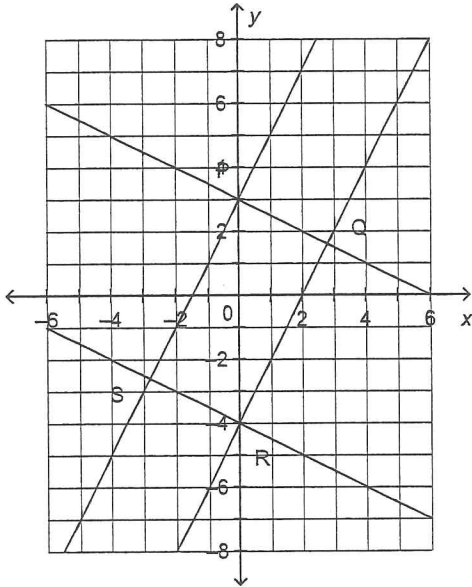
Scale Factor = $\frac{7}{13}$

51. The lines on the grid below intersect to form rectangle PQRS. The equations of the lines are:

$y = 2x + 3$; $y = 2x - 4$; $y = -\frac{1}{2}x + 3$; and $y = -\frac{1}{2}x - 4$

What is the equation of the line on which each side of the rectangle lies?

- a) PQ b) QR c) RS d) PS



$y = mx + b$
 ↑ slope ↑ y-intercept

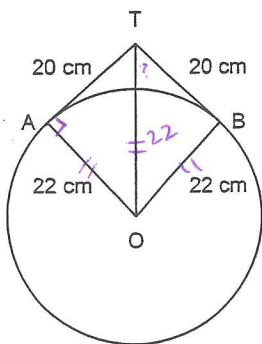
PQ = $y = -\frac{1}{2}x + 3$

QR = $y = 2x - 4$

RS = $y = \frac{1}{2}x - 4$

PS = $y = 2x + 3$

52. A circular mirror with radius 22 cm hangs from a hook. The wire is 40 cm long and is a tangent to the circle at points A and B. How far, to the nearest tenth, above the top of the mirror is the hook?



$a^2 + b^2 = c^2$
 $22^2 + 20^2 = OT^2$
 $484 + 400 = OT^2$
 $884 = OT^2$
 $OT = \sqrt{884}$
 $OT = 29.7321\dots$

so,
 $OT - 22 \text{ cm}$
 $= 29.7321 \text{ cm} - 22 \text{ cm}$
 $= 7.7321$

The hook is about 7.7 cm above the mirror.